Essays on Foreign Bank Penetration in Emerging Economies

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To my loved parents and Minghua

to whom I owe lifetime gratitude

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Abstract

Essays on Foreign Bank Penetration in Emerging Economies

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Foreign bank penetration in emerging economies has been rising rapidly since the 1990s. This thesis examines its effects on host macroeconomic stability, the transmission of monetary policy through the bank lending channel, and its effects on the output in the host countries.

The first essay develops a general equilibrium model to address the propagation of external and internal shocks and the effectiveness of monetary policy in two alternative scenarios: an economy dominated by domestic banks and an economy dominated by foreign banks. By applying numerical simulation methods, we find that an economy with the foreign bank-dominant banking sector is associated with lower loan interest rates, more credit, and higher output, wage and employment, compared to a domestic bank-dominant economy. Moreover, the foreign bank-dominant economy is shown to be less responsive to changes in domestic monetary policy. Overall we conclude that foreign banks play the role of a stabilizing force in the host economies, but the effectiveness of monetary policy is reduced due to the presence of foreign banks in these foreign bank-dominant economies.

The second essay examines empirical evidence of the bank lending channel of the monetary policy by comparing the responses of domestic and foreign banks to

domestic monetary policy shocks at the individual bank level. We find evidence for the existence of an active bank lending channel across domestic and foreign banks. Foreign banks are shown to be less responsive to domestic monetary policy shocks. This lower sensitivity to domestic monetary policy by foreign banks can be explained by foreign banks' access to the internal capital market of their parent banks. The evidence from aggregated data also shows that the effects of monetary policy tend to be buffered in economies with higher foreign bank penetration level.

The third essay examines the implications of foreign bank penetration on economic growth though resource allocation in host countries. It finds some evidence that foreign banks tend to have capital better allocated to more productive sectors. The effect of capital growth on output is higher in economies with more pronounced foreign bank penetration level.

Chapter 1: Foreign Bank Penetration, Shock Propagation and Monetary Policy in Emerging Economies

1.1 Introduction

The main purpose of this essay is to assess the implications of foreign bank penetration in developing countries, in terms of the response of the economic variables of concern to internal and external shocks. Foreign bank penetration has been rising since the late 1980s, and experienced drastic increase in late 1990s in emerging and transition economies. Although extensive empirical work has been devoted to study its effects on domestic economy, the theoretical work is scarce.

This paper develops a simple general equilibrium optimizing model to illustrate the effect of foreign bank penetration in a small economy which is perfectly integrated with the rest of world in both goods and capital markets. Although having access to international bond markets, economic agents depend on domestically operating banks (either domestically or foreign owned) for their consumption and production. Households have to hold deposits to finance a part of their consumption, and firms have to use loans to finance their payment for production factors. Banks are costly in producing deposits and loans, and the interest rates work as the mechanism to transfer internal and external monetary shocks into the real side of the economy.

Existing literature has extensively argued that financial penetration from foreign banks can improve the conditions in financial sector. Foreign banks differ from domestic banks in that they are more efficient in producing deposits and loans, which may enable them to provide higher deposit rate and lower loan rate.[1] With the

[1] Foreign banks may also differ from domestic banks in terms of their access to external funding and product

presence of foreign banks, the domestic banking market is usually observed to be more competitive. A possible danger of foreign bank penetration is the transmission of foreign shocks to domestic agents through the credit channel by foreign banks. In the economy where foreign banks dominate, this is suspected to bring more fluctuation than when the financial sector is not open. In addition, central bankers may worry about the effectiveness of monetary policy in the case of dominant foreign bank penetration. Monetary policy is one of the most important policies in government's arsenal used to reduce the short-term fluctuation and stabilize the economy. No government wants to lose the effectiveness of monetary instruments. The transmission of monetary policy to the real sector depends on several channels, out of which the most controversial one may be the lending channel. [2] Under a contractionary monetary policy, banks cannot completely offset a policy-induced drop in domestic deposits with alternative forms of liabilities, so they may cut down the supply of credit, hence affecting the liquidity position of bank-dependent firms. It is ambiguous how foreign banks respond to the domestic monetary policy, compared to the domestic banks, since they are presumably less costly in producing deposits and loans and hence may be affected less by the drop in deposits. A possible outcome is that, when foreign banks dominate in the domestic banking market, the transmission of

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differentiation. In our model, we highlight their difference in the efficiency to produce financial products.

[2] The other channels include interest rate channel, exchange rate channel, firm balance sheet channel and asset price channel. Interest rate channel is described in the traditional Keynesian theory: monetary policy influences short-term real interest rate given that prices are sticky, altering the cost of capital for firms and thus investment. The exchange rate channel emphasizes the effect of monetary policy on exchange rate and then on the net exports and aggregate output. The firm balance sheet channel is when the creditworthiness of firms is affected by monetary policy and lending depends on borrowers' net wealth, therefore the supply of credit and investment will by affected by their balance sheet. Asset price channel focuses the mechanism that involves Tobin's q on investment spending and wealth effect on consumption. The former argues that a contractionary monetary policy will lower equity price that leads to a lower Tobin's q, and thus lower investment spending and output. The latter pays attention to the lower equity price leads to lower household financial wealth and then lower consumption and output.

monetary policy may lose its effectiveness since the lending channel is more or less blocked.

The remainder of the paper proceeds as follows. The second section will introduce the main picture of foreign bank penetration in developing countries. Section three reviews the related literature concerning our topic. The forth section presents the theoretical model, and the fifth section analyzes the response of the economy in domestic bank dominance and foreign bank dominance using numerical simulation. Section six concludes the paper and presents the direction for future work.

1.2 Background

Foreign bank penetration, as the main stream of financial sector foreign direct investment in developing countries, started in the 1980s and surged in the late 1990s. Most of the penetration has taken place via cross-border mergers and acquisitions (M&A), which rose up form 320 cases during the 1978-1989 period to more than 2000 during the 1990-2001 period (Claessens and Lee, 2002). The share of M&A deals targeting financial institutions in emerging markets increased from 18% in 1990-1996 to 30% in 1997-2000. The value of cross-border M&A in emerging market banks, lingering around $1 billion from 1990 to 1995, increased quickly since then to around $ 17 billions in 2000. Year 2001 witnessed a peak value of $21 billions in M&A, followed by a sharp decline to $5 billions. However, in 2003, the M&A of banks in emerging markets has stabilized around $6 billions (BIS, 2004).

The degree of foreign bank penetration has differed tremendously across regions.

In terms of the total assets of the foreign-owned banks relative to total banking assets, as shown in Table 1.1, foreign bank presence has been very stark in many Central and Eastern European countries such as Croatia, the Czech Republic, Hungary and Poland, and some Latin American countries such as Mexico, Uruguay and Peru. Central European countries received rapidly-growing amount of investment in banking sector since the second half of the 1990s. The M&A deals from foreign banks made up to 24% of all cross-border deals. The two countries that absorbed the largest inflows were Poland and the Czech Republic. In terms of the total assets of banks, Poland and Hungary observed the largest ownership by foreign banks, followed by Croatia, the Slovak Republic and the Czech Republic. In these countries' financial sector, foreign banks control nearly 100% of the banking assets. In Latin America, Mexico became the largest recipient of approximately 50% of the total financial direct investment in the region, which results in the fact that about two-thirds of bank assets are owned by foreign banks. In some other countries, such as Peru, the ownership by foreign banks has exceeded 60% by 2003.

In Asia, the participation of foreign banks is still modest, except in Hong Kong SAR, Malaysia and Macau SAR. However, this region has been recently one of the fastest growing targets for M&A of banks, particularly Korea and Thailand. In the other low-income countries, most of which are on the African continent, foreign bank penetration has also increased in the past decade, but these countries are far from being the main destinations of foreign bank penetration.[3]

[3] The number of the foreign banks has grown to 18% of the total number of banks in those low-income countries by 2000, up from only 5% in 1995. In terms of assets, the foreign banks account for 7% up from 3% in 1995. The

< Table 1.1 >

< Figure 1.1> < Figure 1.2> <Figure 1.3>

The direct establishment of affiliates by foreign banks in domestic markets has increasingly replaced their traditional cross-border claims and liabilities. In Table 1.2 and Table 1.3, by using the data provided by BIS, we see the ratio of local claims (from foreign banks operating locally) to international claims (from abroad headquarters of the foreign banks) has been steadily increasing in many countries during the observed period. Although the value of international claims has been rising, the importance of cross-border lending and borrowing has been obviously weakened by the lending and borrowing through domestic institutions of foreign banks. Considering the fact that the BIS data on local claims only include the lending in domestic currency and that many of local operations in these developing countries are conducted in foreign currencies, our table would most likely understate the direct participation of foreign banks in these markets.

< Table 1.2> <Table 1.3>

There are several potential determinants of foreign bank penetration, in which the main driving force is the financial liberalization and the implementation of market-oriented reforms in the emerging countries. The governments in these nations tried to allow for more competition and then enable a free play of market force in the

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increase has been very sharp in some countries. For example, there were no foreign bank in Tanzania in 1995, but the number increased to 6 in 2000 and controlled 69% of the total bank assets. In Zambia, the number of foreign banks rose to 8 in 2000 from only 2 in 1995, which own nearly 60% of the bank assets in the country. In some countries, foreign banks have been dominant in the banking sector. The penetration rate is 100% in Solomon Islands, 95% in Burkina Faso, 94% in Ivory Coast, 85% in Congo Democratic Republic, and more than 70% in many others (Claessens and Lee, 2002). It is a common fact that there are only a few, in some cases only 1 or 2, banks in these small economies, and therefore the rate of foreign bank penetration may look excessively high. The bank penetration also differs across these low-income countries. In 15 of them, such as, Angola, Bangladesh, Bhutan, Cambodia, and others, there was no foreign bank presence by 2000.

banking sector. New business opportunities appeared with the liberalization in these markets, since the demand for new banking products could give the foreign banks higher returns, especially for those "early birds" who entered the markets first.[4] The governments also improved their legal and regulatory infrastructure, and these decreased the risk of operation in those countries and induced more foreign bank participation.[5] In Europe, the proceeding integration in the EU also facilitates the foreign bank penetration in the Central and Eastern European countries. The single European currency, the deepening Single European Market and the enlargement of European Union by the Central European and Baltic countries accession, encouraged a fresh wave of cross-border mergers and acquisitions in recent years.

The second possible reason of foreign bank entry in domestic markets is the "follow the customer hypothesis", [6] supported by the observed fact that the foreign bank penetration increases with the increase of non-bank FDI.[7]

Intense competition in home markets is the third reason to prompt international banks to open new business in developing countries. In Europe, financial integration induced considerable consolidation among banks and resulted in increasingly saturated banking markets. The European countries like Spain, Germany, Italy and

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[4] Claessens et al. (2001) has found that foreign bank penetration was highest during the period when foreign bank profitability was the highest, taxes were lowest and income per capita was highest. Brealey and Kaplanis (1996), Yamori (1998) and Buch (2000) also found the higher GDP per capita in the host markets, which can be the proxy of the expected gains, was positively related with the extent of foreign bank presence.

[5] There are many papers that have found that the favorable regulatory environment affects the entry of foreign banks positively. Foreign banks are more likely to enter a market which has fewer restrictions on their business activities. See Golberg and Grosse (1994), Buch and DeLong (2001) and Barth et al (2001).

[6] See Aliber (1984), Caves (1979) and some others.

[7] However, the studies testing the "follow your customers" hypothesis provided mixed results. Some supporting evidence were found between developed countries, but the relationship between foreign bank entry and non-bank FDI was found ambiguous between developed home and developing host countries. Further research testing the foreign bank entry and non-bank FDI are therefore required. Soussa (2004) provides an excellent review on the past literature on this hypothesis.

France experienced this kind of consolidation and subsequent market saturation in the 1990s.[8] In the U.S., the relaxation of the restrictions on interstate banking activity and the permission of universal banking entry in the late 1980s and 1990s also triggered a wave of domestic consolidation, which intensified the competition among banks and preceded the expansion of American banks abroad.

Finally, foreign bank penetration was catalyzed by financial crises or economic difficulties in the host countries. After the 1994 Mexican "tequila crisis", the governments in Latin American countries recapitalized the local banks with the help of foreign investors, and accelerated the process of liberalization.[9] In Central and East European countries, governments were also heavily dependent on foreign investment to recapitalize their mostly insolvent domestic banks, in the short recession after the end of communism system. Asian governments expanded the scope of foreign ownership in domestic banks after the 1997 Southeastern Asian financial crisis. Foreign bank penetration grew in the victim countries of the crisis. However, reliance on foreign banks has been much less in Asian countries,[10] and the restrictions more or less remain on the presence of foreign capital in local banks.

[8] That foreign penetration has started partially because of home saturated banking market has been supported by some studies. For example, Guillen and Tschoegl (1999) argued that a main reason for Spanish banks to enter Latin American markets was the saturation in home market. Also, see Soussa (2004).

[9] The 1994 Mexican "tequila crisis" induced a rapid foreign bank penetration as the local investors refused to inject needed resources to domestic banks. Mexican government had to change its strategy of gradual opening of the banking sector, and allowed foreign acquisition of virtually all major domestic banks.

[10] The possible explanations may include the high domestic saving rate and large government-financed bailout. See Moreno and Villar (2005)

1.3 Literature Review

Most economists believe that the domestic banking sector (and in general the domestic economy) tends to be better off in the presence of foreign bank penetration, since the entry of foreign banks may enhance the competition in the markets, provide better resource allocation, boost domestic banks' efficiency and improve domestic financial infrastructure. Many empirical papers have found that foreign bank penetration reduces the interest rate spreads, which is regarded as evidence of increased competition and higher efficiency in domestic banking market (Claessens et al. (2001), Gelos et al. (2004), Crystal et al. (2002), Martinez-Peria et al. (2004) and others).[11] Another benefit from foreign bank penetration is the improved access to international capital markets (Levine (1996), Euh and Baker (1990), Campbell Report (1983), Bhattacharaya (1993)). One policy objective to ease the restrictions on foreign bank entry is to increase the host countries' contact with international financial community and thereby promote capital inflows. Foreign banks are less financially constrained than their domestic counterparts, or say, less dependent on deposit-based funding. They can either resort to external funding from their parent institution, or they have an easier access to international capital market (Crystal et al (2002)). As McFadden (1994) noted, "foreign banks were expected to bring new capital … through access to parent capital and from international markets." Bhattacharaya (1993) reported that in some countries foreign banks helped to make international funds accessible to finance domestic projects.

[11] Levy Yeyati and Micco (2004) finds that foreign bank penetration appears to have led to less competitive environment in banking sector. However, as far as we know, this is the only paper which finds evidence that foreign penetration leads to a decrease in competition.

Some papers argue that foreign banks are more cost efficient (for example, Bonin et al (2005)). Foreign banks can reduce their operation costs by using more advanced technology, and thereby force the domestic banks to upgrade their hardware to maintain competence. For example, in Spain, foreign banks generated a boom of credit cards and ATMs. In Turkey, foreign banks preceded the domestic banks in computerizing most of their operations, adopting modern budgeting technologies and taking SWIFT payment system network. Domestic banks had to follow foreign banks to improve their facilities to maintain their competence. It is very interesting to find that the ratio of employees with university education in the banking sector increased from 10 % to 20 % after greater foreign bank presence was allowed in Turkey (Levine (1996)). It implies that foreign banks not only reduced their operation costs by taking modern technologies and attracting more human capital, but also induced their domestic counterparts to do so. Based on these facts, in our model, we have assumed that foreign banks differ from domestic banks in terms of the efficiency and hence the cost to produce deposits and loans.

Several papers found that foreign banks not only provide services denominated in domestic currency, but also they operate more in foreign currencies (Cihák and Podpiera (2005), Barajas et al. (2006), Farnoux et al. (2004)). This fact is illustrated by the higher proportion of foreign currency liabilities (assets) to total liabilities (assets) within foreign banks. BIS (2004) published its finding that foreign-owned banks are prominent in the rapid expansion of foreign currency lending in some markets. In reality, foreign bank penetration is closely associated with dollarization in

developing and transition countries. Dollarization is characterized by the increasingly holding by households and firms of a significant share of bank deposits and loans in foreign currencies. In our model, we follow Luca (2002) to take into account the loans denominated in both domestic and foreign currencies.

The question is still open whether foreign banks will be a stabilizing force when the domestic market encounters shocks or crises. Some empirical studies have tried to address it, but they provide mixed answers (Martinez Peria et al (2002), Crystal et al (2002), Goldberg et al (2000), Goldberg (2001), De Haas and Van Lelyveld (2003), Martinez Peria et al (2005), Morgan and Strahan (2003), Galindo et al (2004)). De Haas and Van Lelyveld (2003) found that in crisis periods foreign banks contracted their deposits and loans by less than domestic banks. Martinez Peria et al (2002, 2005) found that, although external shocks are initially spilled over via foreign banks from home country into their host countries, foreign banks become over time less sensitive to external shocks, more responsive to host country shocks over long-term, and their changes in lending are associated more with positive shocks than negative shocks. The loans from foreign banks are found not significantly reduced during crisis times. Therefore the foreign bank presence in domestic markets seems to be a stabilizing force and to lessen the probability of crises. Crystal et al (2002) noted that, loan growth is consistently higher for foreign banks than domestic banks. The earlier established foreign banks are providing stronger and more stable loans than both recently acquired foreign banks and domestic banks. Recently acquired foreign banks

behave differently in that they expand loans more slowly.[12] Goldberg et al (2000) also noted that lending from foreign banks in Mexico and Argentina increased more quickly than lending from their domestic counterparts during the 1995 crisis. This evidence suggests that the foreign banks can be more stable in providing loans in host countries during crisis period. Goldberg (2001) shows that U.S. banks are steady credit provider in emerging markets, but the lending of the U.S. banks to Latin American countries is more related to U.S. rather than the host countries' economic conditions. Her findings reflect both the stabilizing role that foreign banks can play in host countries, as well as the possibility that these countries may incur a lending cut-down due to economic fluctuations outside their frontier. Morgan and Strahan (2003), however, found that foreign bank entry may intensify rather than dampen economic volatility in host countries. Galindo et al (2004) found evidence that foreign banks' response depends on the nature of the shocks. Foreign banks will be more sensitive to expected return shocks, but less sensitive to funding cost shocks.

It is surprising that only scant literature tried to address the question of whether foreign and domestic banks respond differently under monetary policy shocks of the host country. In practice, a common worry among central bankers in developing countries with regards to foreign bank penetration is whether it would lead to less effective domestic monetary policy. The effectiveness of monetary policy depends on whether banks will behave as expected. A contractionary monetary policy may work

[12] Another related question is whether foreign bank entry may adversely affect firms' (especially small and medium-sized firms') access to credit. Clarke et al (2001) concluded that foreign bank penetration overall improves firms' access to credit. Although large firms get more benefits, the small firms are also better off. Nevertheless, Clarke et al (2002), when using the data for Latin American countries, found that foreign banks do lend less to small enterprises. It is obvious that more tests will be needed to reach a conclusive answer.

well only when banks respond "appropriately" by raising the interest rate and cutting down loans. Otherwise, the monetary policy loses by some extent its effectiveness. It is still ambiguous among central bankers whether foreign banks will respond the same as the domestic banks to monetary policy shocks.[13]

Banks' response to monetary policy shocks is related to the lending channel of monetary transmission. Starting with the seminal paper of Bernanke and Blinder (1988), the lending-channel theory argues that the banking system may play a non-trivial role in the transmission of monetary policy to real economic sector. When monetary policy is tightened, banks will cut back their lending to borrowers in response to a fall in deposits,[14] so that the firms which depend on bank loans to finance production will have limited access to credit, which in turn affects the investment and output in the economy.[15] Only a few papers studied the lending channel in the scenario of foreign bank penetration. Arena et al (2004) empirically compared the response of loans, deposits, and bank-specific lending and deposit rates, to various monetary conditions across domestic and foreign banks in twenty emerging market economies.[16] They found that foreign banks display lower interest rate sensitivity to changes in monetary conditions, although there were no significant

[13] One reason that central bankers worry about the effectiveness of monetary policy in the scenario of foreign bank penetration is that foreign banks may have easier access to international funds, which might be less affected by the host central banks. "On one hand, more competitive financial system and deeper financial markets would reinforce the transmission of interest rate signals, thereby enhancing the effectiveness of monetary policies. On the other hand, strong lending by foreign banks in foreign currency would be difficult to control as it is driven by funding conditions in international markets." (CGGS of BIS (2005))

[14] Deposits will be reduced because the contractionary monetary policy will reduce the bank reserves and hence reduce the "created" deposits.

[15] A lot of papers can be found discussing bank lending channel of monetary policy, such as Bernanke (1993), Kashyap et al. (1993), Bernanke and Gertler (1995), and Kashyap and Stein (1995).

[16] They studied the effect of changes in monetary conditions on the credit market, regardless of whether the changes in monetary conditions are induced, or not, by monetary policies. The monetary conditions included not only money market rates and reserve requirement, but also international interest rate and the change of the foreign exchange rate.

differences in the response of volume of loans and deposits. Mora (2005), using Mexico data from 1995 to 2002, discussed the effectiveness of the lending channel given that banks have deposits and loans in both domestic and foreign currencies, and found that the deposits and loans of banks that have a larger share of foreign deposits are less sensitive to domestic monetary shocks but more sensitive to foreign monetary shocks.[17]

1.4 Model

The model is an extension of Edwards and Végh (1997) and Luca (2002). The model provides a framework upon which we will study the response of the economy to monetary shocks. We examine two scenarios, one in which the banking market is dominated by domestic banks, and one in which it is foreign bank dominated. We are interested in finding whether the shocks' effects are qualitatively and quantitatively different in the two scenarios.

1.4.1 The Economy

Four agents exist in our economy: households, firms, banks and the government. Firms are owned by households. Firms and banks are perfectly competitive in their industries. The economy is assumed perfectly integrated with the rest of the world in goods and capital market. All agents have access to the international bond markets at the nominal international interest rate i_t^*. We assume that the banking market is

[17] Some other related works include Chang and Velasco (2001).

composed either of only domestic banks (domestic bank dominance) or only foreign banks (foreign bank dominance). We distinguish domestic and foreign banks not only by their ownership, but more importantly, by their efficiency to produce demanded deposits and loans.

One non-storable good is produced and consumed. The good is internationally traded at the international price P_t^*. The domestic price of the good is P_t, where by the law of one price $P_t = E_t \cdot P_t^*$. E_t is the nominal exchange rate in terms of domestic currency per unit of foreign currency. Hereinafter, we will denote the domestic currency by "peso" and the foreign currency by "dollar". Bonds are denominated in dollar. Real variables will be expressed in the terms of the good.

There is no uncertainty in our model. All agents have perfect foresight. The rate of devaluation of the exchange rate, $\varepsilon_t = \dot{E}_t / E_t$, is assumed predetermined. Based on the law of one price, domestic inflation rate π_t is equal to the international inflation rate π_t^* plus the rate of devaluation of peso ε_t, that is, $\pi_t = \pi_t^* + \varepsilon_t$. π_t^* is assumed exogenous and constant. We assume perfect capital mobility and Fisher equation holds so that $r = i_t^* - \pi_t^*$, where r is the real interest rate and the same across the world.

This is an inside money economy. We assume agents in the economy do not hold cash. We introduce the role for deposits and loans through deposit-in-advance and credit-in-advance constraints. Households are assumed to use bank deposits to finance a part of their consumption, and firms to use bank loans to pay production costs. Firms produce the good using a CES technology, and labor and foreign imported

inputs as production factors. Firms need to use peso loans to pay for the wages, and dollar loans for a part of the foreign imported inputs. Banks produce the demanded deposits and loans. We assume banks finance their loans using domestic peso deposits and external funds (international bonds) in the international markets. Banks can not lend in the international bond markets. At every period, the asset-liability identity holds.

The government, which combines both monetary and fiscal authorities, conducts monetary policy by changing the reserve requirement ratio of deposits. A raise in the reserve ratio will lead to a contraction in the money supply, while a drop in the ratio will cause an expansion in the money supply. The government also chooses the rate of devaluation.

There are no dynamics in our model. The economy is always in steady state equilibrium. When a shock hits the economy, the agents can make instantaneous adjustment and the economy jumps from one steady state equilibrium to a new one.

1.4.2 Household

In our model, households consume the final good and supply labor in the labor market. The lifetime utility function is composed of consumption and leisure (which is defined as the total endowed time 1 minus the labor):

$$U = \int_0^{\infty} [\log(c_t) + \log(1 - l_t)] e^{-\beta t} dt \tag{1}$$

where c_t is the consumption in real term, l_t is the labor provided by households, and $\beta (> 0)$ is the subjective discount rate.

Households hold two assets: domestic peso deposits and internationally traded bonds. The households' financial wealth in real terms (denoted by a_t^h) is thus:

$$a_t^h = d_t + b_t^h \tag{2}$$

where d_t represents the real stocks of deposits and b_t^h international bonds.

Household's flow constraint is given by:[18]

$$\dot{a_t^h} = ra_t^h - (i_t^* + \varepsilon_t - i_t^d)d_t + \Omega_t^f + w_t l_t + \tau_t - c_t \tag{3}$$

where i_t^d is the nominal interest rate for peso deposits. Ω_t^f denotes the profits of firms which appears in the flow constraint since firms are owned by households. w_t is the real wage of labor, and τ_t is the transfer payment from government. The appendix provides more details on the derivation of the flow constraint.

Households must hold d_t to finance a fraction ϕ of their consumption, so

$$d_t = \phi c_t \tag{4}$$

We obtain households lifetime budget constraint by integrating (3) and taking appropriate transversality condition:

$$a_0^h + \int_0^\infty (\Omega_t^f + w_t l_t + \tau_t)e^{-rt}dt = \int_0^\infty [c_t + (i_t^* + \varepsilon_t - i_t^d)d_t]e^{-rt}dt \tag{5}$$

where a_0^h is the initial wealth of the households. The lifetime budget constraint tells us that, the present discounted value of "total expenditure" (given by the RHS, which includes the lifetime consumption and the additional cost of holding peso deposits) must be equal to households' wealth that comprises his initial real financial assets and the present discounted value of the income and government transfer payments. The

[18] Here we do not include the profit of banks in households flow constraint. If the banks are domestically owned, the profits of banks can be assumed to be owned by households. However, when banks are owned by foreigners, it does not make sense that these profits will belong to households. This exclusion of bank profits from households flow constraint will not affect the first order conditions of households obtained by maximize their lifetime utility.

additional cost is stemmed from the constraints that households have to hold peso deposits to finance a part of their consumption.

The households' optimization problem consists in choosing consumption c_t and labor l_t, for all $t \in [0,\infty)$ to maximize lifetime utility Eq.(1), subject to the deposits-in-advance constraint Eq.(4) and lifetime budget constraint Eq.(5), given the initial financial wealth a_0^h and the time path of w_t, i_t^*, ε_t, i_t^d, Ω_t^f and τ_t.

$$\underset{c_t, l_t}{Max} \quad U = \int_0^\infty [\log(c_t) + \log(1 - l_t)] e^{-\beta t} dt \tag{6}$$

$$\text{s.t.} \quad a_0^h + \int_0^\infty (\Omega_t^f + w_t l_t + \tau_t) e^{-rt} dt = \int_0^\infty [c_t + (i_t^* + \varepsilon_t - i_t^d) d_t] e^{-rt} dt$$

$$d_t = \phi c_t$$

and $\beta = r = i_t^* - \pi_t^*$ [19]

The first order conditions are:

$$\frac{1}{c_t} = \lambda [1 + \phi (i_t^* + \varepsilon_t - i_t^d)] \tag{7}$$

$$\frac{1}{1 - l_t} = \lambda w_t \tag{8}$$

where λ is the marginal utility of wealth. Households maximize their utility by equalizing the marginal utility of consumption to the marginal utility of wealth times the effective price of consumption. The effective price of consumption is the direct cost of one more unit of consumption plus the additional cost for households to hold peso instead of international bonds. At the optimum, the marginal utility of leisure is equal to the marginal utility of wealth times the real wage. Households supply more labor and give up more leisure when the real wage is higher. Given the optimal choice

[19] As usual, here we assume $\beta = r$ to avoid unnecessary dynamics.

of consumption, Eq.(4) determines the optimal path of peso deposits.

1.4.3 Firms

The representative firm produces goods following a CES production function. Two production factors are inputted, one of which is domestic labor, and the other is imported foreign inputs.[20] The CES production function is:

$$y_t = (n_t^{\frac{\sigma-1}{\sigma}} + l_t^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}} \tag{9}$$

where n_t is the foreign inputs, and σ is the elasticity of substitution and $\sigma > 0$. The firm has to use peso loans z_t from banks to pay the wage to workers, and dollar loans z_t^* to pay a part α of the imports of foreign inputs.[21] Both z_t and z_t^* are in real terms.

$$z_t = w_t l_t \tag{10}$$

$$z_t^* = \alpha p_t n_t \tag{11}$$

where p_t is the relative price of imported foreign inputs to the international price of exported final goods, and thus $p_t < 1$.

Firm's real financial wealth a_t^f is composed of the holdings of international bonds b_t^f, and peso and dollar loans:

$$a_t^f = b_t^f - z_t - z_t^* \tag{12}$$

The flow constraint is:

$$\dot{a}_t^f = r a_t^f - (i_t^l - i_t^* - \varepsilon_t) z_t - (i_t^{l*} - i_t^*) z_t^* + y_t - w_t l_t - p_t n_t - \Omega_t^f \tag{13}$$

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[20] One example of the imported foreign inputs may be the imported capital-intensive components. Firms in developing countries import the components and use local labor to assembly the components into final goods.

[21] We assume the spot exchange market does not work here. That is, the firm can only borrow dollar loans to pay the foreign inputs and peso loans to pay labor wage. The firm cannot borrow dollar first and then convert into peso at the spot exchange market.

where i_t^l is the nominal interest rate of peso loans, and i_t^{l*} the interest rate of dollar loans. Please notice that the term $(i_t^l - i_t^* - \varepsilon_t)z_t$ represents the additional cost incurred by the firm for having to use peso loans to pay the wage of labor, and $(i_t^{l*} - i_t^*)z_t^*$ the additional cost for having to use dollar loans to finance the payment for imported foreign inputs. For the complete derivation, see the appendix.

We obtain the lifetime profits of the firm by integrating (13) and imposing the transversality condition:

$$\int_0^\infty \Omega_t^f e^{-rt} dt = a_0^f + \int_0^\infty [y_t - w_t l_t - p_t n_t - (i_t^l - i_t^* - \varepsilon_t)z_t - (i_t^{l*} - i_t^*)z_t^*]e^{-rt} dt \quad (14)$$

where a_0^f is the initial financial wealth of the firm.

Therefore, the firm's optimization problem consists in choosing labor l_t and imported foreign inputs n_t, in order to maximize the present discounted value of profits Eq.(14), given the initial financial wealth a_0^f and the time paths of w_t, p_t, i_t^*, ε_t, i_t^l and i_t^{l*}:

$$\underset{l_t, n_t}{Max} \int_0^\infty \Omega_t^f e^{-rt} dt$$

s.t. $\int_0^\infty \Omega_t^f e^{-rt} dt = a_0^f + \int_0^\infty [y_t - w_t l_t - p_t n_t - (i_t^l - i_t^* - \varepsilon_t)z_t - (i_t^{l*} - i_t^*)z_t^*]e^{-rt} dt$

$z_t = w_t l_t$

$z_t^* = \alpha p_t n_t$

and $y_t = (n_t^{\frac{\sigma-1}{\sigma}} + l_t^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}}$

The F.O.C.s are:

$$(n_t^{\frac{\sigma-1}{\sigma}} + l_t^{\frac{\sigma-1}{\sigma}})^{\frac{1}{\sigma-1}} n_t^{-\frac{1}{\sigma}} = p_t[1 + \alpha(i_t^{l*} - i_t^*)] \quad (15)$$

$$(n_t^{\frac{\sigma-1}{\sigma}} + l_t^{\frac{\sigma-1}{\sigma}})^{\frac{1}{\sigma-1}} l_t^{-\frac{1}{\sigma}} = w_t[1 + (i_t^l - i_t^* - \varepsilon_t)] \quad (16)$$

These equations state that, the firm must equalize the marginal product of the production factors to their marginal cost. The marginal product of foreign inputs has to be equal to its relative international price, plus the additional cost for having to use dollar loans instead of bonds for the payment. The marginal product of labor is equal to the wage payment plus the additional cost that the firm has to use peso loans to finance the wage.

1.4.4 Banks

The assets of banks, a_t^b, are composed of the following parts, all in real terms: peso and dollar loans to firms, respectively z_t and z_t^*; and reserves on peso deposits, $\delta_t d_t$, where δ_t is the reserve ratio. The liability side of banks includes the peso deposits collected from households and bonds issued from international bond markets, b_t^b. Here banks can only borrow but they can not lend in the international bond market.

Banks incur cost in collecting deposits and issuing loans. We assume the cost of banks to "produce" deposits and loans, η, is divided into two parts, respectively for peso and dollar activities:

$$\eta = (Ad_t^\rho + Bz_t^\rho)^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho}$$

where $\rho > 1$. A, B, C and D are parameters that measures the efficiency of banks to produce deposits and loans in peso and dollar, and A, B, C, D > 0. To compare the

different economy response to monetary shocks in domestic bank dominance scenario and foreign bank dominance scenario, we will assume foreign banks have different efficiency parameters from domestic banks.

Banks' financial wealth is given by:

$$a_t^b = z_t + z_t^* - (1-\delta_t)d_t - b_t^b \tag{17}$$

The flow constraint is:

$$\begin{aligned} \dot{a}_t^b = & ra_t^b - (i_t^* + \varepsilon_t)\delta_t d_t + (i_t^l - i_t^* - \varepsilon_t)z_t + (i_t^{l*} - i_t^*)z_t^* \\ & - (i_t^d - i_t^* - \varepsilon_t)d_t - \Omega_t^b - (Ad_t^\rho + Bz_t^\rho)^{1/\rho} - (Cz_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho} \end{aligned} \tag{18}$$

where Ω_t^b is the profits of banks. The derivation is provided in the appendix.

We assume there is no assets accumulation or decumulation in banks every period, so $\dot{a}_t^b = 0$, which implies:

$$b_t^b = z_t + z_t^* - (1-\delta_t)d_t \tag{19}$$

Banks' lifetime profits can be obtained by integrating (18) and imposing the transversality condition:

$$\begin{aligned} \int_0^\infty \Omega_t^b e^{-rt}dt = a_0^b + \int_0^\infty & [(i_t^l - i_t^* - \varepsilon_t)z_t + (i_t^{l*} - i_t^*)z_t^* - (i_t^* + \varepsilon_t)\delta_t d_t \\ & - (i_t^d - i_t^* - \varepsilon_t)d_t - (Ad_t^\rho + Bz_t^\rho)^{1/\rho} - (Cz_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho}]e^{-rt}dt \end{aligned} \tag{20}$$

where a_0^b is the initial wealth of banks.

Banks choose domestic peso deposits d_t, peso loans z_t, and dollar loans z_t^* to maximize the present discounted value of profits Eq.(20), given the initial assets a_0^b and the time paths of $i_t^*, \varepsilon_t, i_t^{l*}, i_t^l, i_t^d$ and δ_t. The holdings of bonds b_t^b are adjusted to ensure that Eq. (19) hold in every period.

The F.O.C.s are:

$$i_t^l = i_t^* + \varepsilon_t + B(Ad_t^\rho + Bz_t^\rho)^{\frac{1-\rho}{\rho}} z_t^{\rho-1} + D(Cz_t^{*\rho} + D(b_t^b)^\rho)^{\frac{1-\rho}{\rho}} (b_t^b)^{\rho-1} \quad (21)$$

$$i_t^{l*} = i_t^* + C(Cz_t^{*\rho} + D(b_t^b)^\rho)^{\frac{1-\rho}{\rho}} z_t^{*\rho-1} + D(Cz_t^{*\rho} + D(b_t^b)^\rho)^{\frac{1-\rho}{\rho}} (b_t^b)^{\rho-1} \quad (22)$$

$$i_t^d = (1-\delta_t)(i_t^* + \varepsilon_t) - A(Ad_t^\rho + Bz_t^\rho)^{\frac{1-\rho}{\rho}} d_t^{\rho-1} + (1-\delta_t)D(Cz_t^{*\rho} + D(b_t^b)^\rho)^{\frac{1-\rho}{\rho}} (b_t^b)^{\rho-1} \quad (23)$$

Some insights can be obtained immediately from Eq.(21)-(23). First, these equations reflect the financial distortion in the economy. If banking is costless, banks will equate the lending rate with the bond interest rate, and equate the deposit rate with the bond interest rate weighted by $(1-\delta_t)$. Second, the spread between loan interest rate and bond interest rate depends not only on the marginal cost of credit, but also the marginal cost of bonds. For example, when z_t increases, it directly increases the interest rate i_t^l through the rise of the marginal cost of peso loans, and at the same time, indirectly through the rise of the marginal cost of bonds, since increasing z_t raises the demand for bonds. Similarly, the spread between deposit rate and bond interest rate is also affected not only by the marginal cost of deposits but also by the marginal cost of bonds.

1.4.5 Government

The government holds international reserves in the form of international bonds, b_t^g. Its liabilities consist of the reserves on peso deposits of banks. The government receives returns from the international reserves and uses the returns to give lump-sum transfer to households. The government can not lend in the banking market. The monetary authority in government sets the path of the rate of devaluation, ε_t, and

determines the reserve ratios for deposits, δ_t.

Government's assets are:

$$a_t^g = b_t^g - \delta_t d_t \tag{24}$$

Following Edwards and Végh (1997), we assume that the banking cost is not a social cost.[22] The flow constraint is given by:

$$\dot{a_t^g} = r a_t^g + (i_t^* + \varepsilon_t)\delta_t d_t - \tau_t + (A d_t^\rho + B z_t^\rho)^{1/\rho} + (C z_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho} \tag{25}$$

which can give us the lifetime constraint:

$$\int_0^\infty \tau_t e^{-rt} dt = a_0^g + \int_0^\infty [(i_t^* + \varepsilon_t)\delta_t d_t + (A d_t^\rho + B z_t^\rho)^{1/\rho} + (C z_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho}] e^{-rt} dt \tag{26}$$

1.4.6 Equilibrium Conditions

The economy's flow constraint is derived from aggregating the flow constraints of the four agents (households, firms, banks and government), given by equations (3), (13), (18) and (25), and taking into account $\pi_t = \pi_t^* + \varepsilon_t$ and $i_t^* = r + \pi_t^*$:

$$\dot{k_t} = r k_t + y_t - p_t n_t - c_t \tag{27}$$

where k_t denotes the economy's net stock of bonds, and $k_t = b_t^h + b_t^f - b_t^b + b_t^g$.

The economy's resource constraint can be derived from (27) by imposing the appropriate transversality condition:

$$k_0 + \int_0^\infty (y_t - p_t n_t - c_t) e^{-rt} dt = 0 \tag{28}$$[23]

---

[22] Edwards and Végh (1997) justifies this assumption by saying "some federal agency providing (at zero cost) the monitoring and administrative services needed to run the banks. The profits of this federal agency are returned to households as lump-sum transfers."

[23] If the scenario is foreign bank dominant in the banking market, the resource constraint is: $k_0 + \int_0^\infty (y_t - p_t n_t - c_t - \Omega_t^b) e^{-rt} dt = 0$. This does not change the resource constraint too much since banks are

1.4.7 Competitive Equilibrium

The competitive equilibrium is defined by the set of allocations of households $\{c_t, l_t, d_t, a_t^h\}$, firms $\{l_t, n_t, z_t, z_t^*, a_t^f\}$, banks $\{d_t, b_t^b, z_t, z_t^*\}$, and prices $\{i_t^d, i_t^l, i_t^{l*}, w_t\}$, given the exogenous prices and policy variables $\{i_t^*, \varepsilon_t, \delta_t, P_t, P_t^{mt}, P_t^*, \pi_t^*\}$, such that:

1. F.O.C.s for households, Eq.(7) (8), for firms, Eq.(15) (16),and for banks, Eq.(21) (22) (23) hold;

2. Government budget constraint, Eq.(25) (26) is satisfied;

3. The labor market clears. The labor supply function is given by Eq.(8), and the labor demand function is given by Eq.(16). When the labor market clears, $l_t^{\text{supply}} = l_t^{\text{demand}}$.

4. Financial market clears. There are three financial products in the economy, d_t, z_t and z_t^*. The deposit supply function is given by Eq.(4), and the deposit demand function is given by Eq.(23), and $d_t^{\text{demand}} = d_t^{\text{supply}}$. The peso loan demand function is given by Eq.(10) given the optimal labor inputs l_t, the peso loan supply function is given by Eq.(21), and $z_t^{\text{demand}} = z_t^{\text{supply}}$. The dollar loan demand function is given by Eq.(11) given the optimal foreign inputs n_t, the dollar loan supply function is given by Eq.(22), and $z_t^{*\,\text{demand}} = z_t^{*\,\text{supply}}$.

5. The economy's flow constraint Eq.(27) and resource constraint Eq.(28) hold. These conditions state the current account identity that $CA = -KA$.

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competitive and in equilibrium their profits are zero.

1.5 Simulation

In this section, we analyze the effects of external and internal shocks on the economy by applying numerical simulation. The economy is assumed initially in steady-state equilibrium, and when the shock occurs, the economy adjusts instantaneously and shifts to a new steady-state equilibrium.

To understand the importance of foreign bank penetration to the host country, we compare two scenarios of the host banking sector, one of which is characterized by domestic bank dominance (or no foreign bank presence), and the other foreign bank dominance (or all banks are foreign owned). Thinking about the phenomenal presence of foreign banks in some markets, these assumptions, although extreme, still make sense.

The presence of foreign banks, since they are more efficient in producing deposits and loans, is expected to buffer some external and internal shocks. If this is justified, it might make the case for more financial liberalization in developing countries. With deeper integration with the rest of world in capital mobility, the developing countries may benefit from more credit and more favored interest rate. When external shocks hit the economy, the economy may be less affected. However, for central banks, it raises more challenges to the effectiveness of monetary policy since the foreign banks might be less sensitive to the monetary changes. Compared with domestic bank dominance, the dominance of foreign banks might imply that the economy will respond to monetary policy less than expected, therefore the central

banks may need to conduct the monetary policy more starkly.

Unfortunately, the model in Section 4 can not be solved analytically. The difficulties to explore how the cost efficiency parameters affect the response of the variables of interest force us to apply numerical simulation in our question. The parameters we choose are illustrated in Table 1.4. All parameters are assumed at reasonable values. The difference between foreign and domestic banks lies in that foreign banks are more cost efficient in producing foreign currency denominated loans and borrowing from external source, therefore the cost efficiency parameters C and D are set at 0.03 and 0.06, while the counterparts in domestic banks are set at 0.07 and 0.15 respectively. There are some arguments among economists on whether foreign banks overcome their information disadvantage in host countries with their cost efficiency.[24] In our simulation, we set the parameters A and B, which measure banks' cost efficiency in domestic currency deposits and loans, at the same values for both foreign and domestic banks, where A = 0.025 and B = 0.05. That is, we assume foreign banks is as cost efficient as domestic ones in domestic currency business.

<Table 1.4>

1.5.1 International Interest Rate Shock

We increase international interest rate from 0.01 to 0.34, and the results are provided in Figure 1.4.

[24] For example, Jeon and Miller (2005) believes that in general, the empirical evidence that foreign banks perform better than domestic banks implies that their cost efficiency advantage overpowers their information disadvantage in developing countries. Berger et al (2001) finds only banks from the U.S. exceed the domestic banks in cost efficiency and offset their disadvantage in information accession.

<Figure 1.4>

In the steady state, the foreign bank dominated economy, compared to domestic bank dominated economy, observes higher bank credit denominated in both currencies. Foreign banks provide lower loan interest rates, which is favored to the bank dependent firms to finance their production factors. Foreign banks collect less domestic deposits but resort to more external borrowing (which is proxied by more international bonds). This is consistent to the general agreement that foreign banks have a better access to external funding, and can bring more capital inflow into the host country. Different from the past literature, the external funding of banks is endogenous instead exogenous. Foreign banks will bring more external capital into the host country because it is optimal for it to do so. Lower interest rate of loans reduce the marginal cost of production factors, so firms will demand more credit to pay for more labors and imported inputs. The more inputs in production result in higher output. The wage is as well higher due to higher demand for labor, and higher labor inputs also imply the unemployment rate in the foreign bank dominated economy may be lower than the domestic banks dominated economy. However, consumption is lower when foreign banks are dominant because the lower deposit rate increases the opportunity cost of consumption. In our simulation, the economy experiences a trade deficit, but the foreign bank dominance helps to reduce the deficit.

When the economy is hit by an international interest rate shock, these two economies respond in the same direction but at different pace. Banks (both domestic and foreign) will increase their interest rates of loans, which increase the marginal

cost of labor and imported inputs and therefore reduce firms' demand for these two production factors. Output falls correspondingly. The less demand for labors results in lower wage and less employment. Banks increase the deposit interest rate, but the opportunity cost of consumption still increase because the increase in deposit interest rate is slower than the increase in international interest rate, thus banks collect fewer deposits. With loans being reduced, banks reduce their external funding. However, foreign bank dominated economy is less affected by the international interest rate shock in terms of the response magnitude. Thanks to the higher cost efficiency in foreign banks, their loans in both currencies fall at a smaller rate, which prevents the marginal cost of labor and imported inputs from increasing too much, so the demand for these two production factors will be reduced less which buffers the fall in output. Wages will also be reduced only by a smaller extent and it detains a rapid increase of unemployment. The deposits are less reduced and as well the consumption. Foreign banks reduce their external funding less than domestic banks, which means the capital inflow will not fluctuate too much.

It is very interesting that foreign banks and domestic banks adjust their interest rate at the same rate, but foreign banks always charge smaller interest rate of loans.

In sum, when the economy is hit by international interest rate shock, foreign bank presence plays a stabilizing force that prevents the real economic activities from falling too much, so the economy is better off from less fluctuation.

1.5.2 Monetary Policy Shock

Given the international interest rate unchanged, which is set at 0.04, we assume the central bank needs to execute contractionary monetary policy for some reason by increasing the reserve requirement ratio from 0.01 to 0.34. The results are provided in Figure 1.5.

<Figure 1.5>

The economy dominated by foreign banks experiences higher credit, production inputs, output, wage and employment at any level of reserve requirement ratio. Foreign banks provide more loans but collect fewer deposits, and borrow more external funding. When the economy is hit by internal monetary policy shocks, both economies react in the same direction but at different rate, except the external funding. Foreign banks increase their interest rates of loans but much more slightly in comparison to domestic banks, especially the interest rate of dollar loans. The demand for loans then will be reduced by a smaller extent, and as well the labors and imported inputs. Output is less dampened thanks to smaller reduction in production factor inputs. The less affected demand for labor also stops the wage and employment from being reduced too much. Banks will reduce their deposit interest rate, but the reduction in foreign banks is more slowly than domestic banks. The fall in deposit interest rate increases the opportunity cost of consumption, and leads to the fall in consumption. The fall in consumption is buffered since the fall in deposit interest rate and correspondingly the rise in the opportunity cost of consumption is slower. Foreign and domestic banks will behave differently to adjust their external funding. Foreign

banks will increase their borrowing from international capital, because the fall in their loans is smaller relative to the fall in deposits, so they need to resort to more external funding. Domestic banks will reduce their external funding since the reduction in their loans exceeds the fall in the deposits, so they need to cut down instead of increase their external borrowing.

The contrast between domestic and foreign banks response to monetary policy shocks is very impressive. It implies that monetary policy can be a very effective instrument to affect the macroeconomy by the central bank when the banking sector is dominated by domestic banks, however, after foreign banks become dominant, the effectiveness of monetary policy is partially lost. This finding suggests central bankers keep cautious and avoid overestimating the force of monetary policy.

1.5.3 Monetary Policy as the Stabilization Tool under International Interest Rate Shock

When the economy is hit by external interest rate shock, government can isolate output from being affected by executing appropriate monetary policy. We hold the output to be constant at 0.0455 and 0.0966 respectively for domestic and foreign bank dominated economy, produced when international interest rate set at 0.04 and reserve requirement ratio set at 0.08. Then we increase the international interest rate from 0.01 to 0.69. The results are provided in Figure 1.6.

<Figure 1.6>

The government can carry out expansionary monetary policy to isolate output

from being reduced by cutting down the reserve requirement ratio.[25] The reduction in reserve requirement ratio can offset the effect of the increase in international interest rate on production factor. Banks increase their loan interest rate to offset the increase in international interest rate. Labor and imported inputs will be held constant, and correspondingly wage will not be changed either. Loans in both currencies maintain constant, deposits and external funds will be reduced, but the reduction in the reserve requirement ratio will hold the bank assets and liability to be equal.

In the foreign bank dominated economy, the government has to reduce the reserve requirement ratio more aggressively, in comparison to the domestic bank dominated economy. It needs to adjust down the reserve requirement ratio more greatly in terms of magnitude and more quickly in terms of speed. If the government is retarded to do so, the output will be reduced associated with reduction in production inputs and employment, which means the economy will suffer from a depression.

Although the government can isolate the output from being reduced, it can not isolate consumption at the same time. Consumption will fall because of the increase of its opportunity cost. However, consumption will fall more slowly in the foreign bank dominated economy.

[25] The government can also isolate the output by adjusting down the exchange rate, which means an appreciation of its currency. What they need to do is only reducing the rate of depreciation ε at the same rate of the increase in international interest rate. All variables will be held constant, except the foreign currency loan interest rate. However, it is hard to judge whether this is a better policy solution in our model. In reality, the developing countries are reluctant to appreciate their currency.

1.5.4 Exchange Rate Policy Shock

We assume the government adjusts its exchange rate policy by increasing the rate of depreciation for some reason. We set the parameters at the benchmark value, and increase the rate of depreciation ε from 0.01 to 0.69. The results are shown in Figure 1.7.

<Figure 1.7>

Consumption will fall as the currency is depreciated, although the interest rate of deposits increases, partially offsetting the increase of opportunity cost of consumption from currency depreciation. Banks increase the loan interest rates, and cut down the credit to firms. Firms demand less production factor, resulting in a fall in output, wage and employment.

The response of the economy dominated by foreign banks is very similar to the one under the shock of international interest rate shock, in terms of both magnitude and speed. The variables of interest adjust at a slower rate than in the economy dominated by domestic banks. However, in the foreign bank dominated economy, the effect of exchange rate on dollar loan interest rate is much more slight, being reflected by a small rise of the interest rate, as opposed to a much more obvious increase in the domestic bank dominance economy. This can be explained by the slower variation in banks' marginal cost to offer dollar loans and borrow international bonds, due to the initial higher amount of dollar loans and bonds.

This finding serves as evidence that the foreign bank presence is a stabilizing force in the economy, but may be at the cost of a part of the effectiveness of domestic

policies.

1.6 Conclusion

The increasing presence of foreign banks in emerging markets raised the question to economists what are the implications of it to host countries. In our paper, the cost efficiency of banks plays important role in producing loans and deposits, and deciding the interest rates of lending and borrowing. Households' deposits and then consumption are affected. The bank-dependent firms determine their optimal labor and foreign inputs by equalizing the marginal products and the marginal costs of production factors, which are affected by banks' interest rates. Firms' optimal decisions affect the demand for labor, the wage in labor market and the output of the economy.

In the steady state, the economy dominated by foreign banks in banking sector, in comparison to the economy dominated by domestic banks, observes more financial credits in both currencies and more capital inflow via banks. Higher credit supports more demand for production factors and produces more output. Wage is also higher due to higher demand for labors. When the economy is hit by international interest rate shock, the economy dominated by foreign banks will respond in a different pattern by reducing their loans and deposits (denominated in both currencies) on a slower pace. The real economic activities, such as output, consumption, production factors and wage, will also be adjusted down but more slowly than the economy with dominant domestic banks. The above results suggest that foreign banks can be a

benedictory and stabilizing force to the host country, so a further financial liberalization can make the economy better off. However, our simulation findings also imply the benediction from more foreign bank participation is not cost-free. The monetary policy loses part of its effectiveness in influencing the real economic activities. When the international interest rate is steadily given, and for some reason the central bank carries out contractionary monetary policy, foreign banks reduce their loans and deposits more reluctantly, in contrast to a quicker drop by domestic banks. In terms of interest rate, foreign banks are as well less sensitive by only adjusting it more slowly. The real activities are thus less affected by monetary policy. When the economy is hit by international interest rate shock, albeit the central bank can adopt expansionary monetary policy to stabilize the output, it needs to do it more aggressively when foreign banks are dominant. Based on the comparison to the economy dominated by domestic banks, monetary policy loses some of its edge to help the central bank to manage the real economy. The central bankers may need to remain cautious to execute their monetary policy by avoiding an overestimate of its effectiveness when facing an increase in foreign bank presence. The adjustment of exchange rate policy results in similar variation in variables as to the shock in international interest rate.

This paper is far from an end to the research on the implication of foreign bank penetration on macro-economy of the host country. In a more complex reality, domestic and foreign banks usually co-exist and may interact with each other in the banking sector which is more close to an oligopoly with differentiated products.

Therefore it is worthwhile to improve our model by establishing it upon an imperfect competitive framework. This will be left to our future research.

Appendix A to Chapter 1

A.1 The Model

A.1.1 Households

Households' nominal assets holding is:

$$A_t^h = D_t + E_t \cdot B_t^h$$

It can be rewritten into the real terms:

$$a_t^h = d_t + b_t^h$$

On one side,

$$\dot{A}_t^h = i_t^d \cdot D_t + E_t \cdot i_t^* \cdot B_t^h + \dot{E}_t \cdot B_t^h + P_t \cdot \Omega_t^f + P_t \cdot w_t \cdot l_t + P_t \cdot \tau_t - P_t \cdot c_t$$

$$\Rightarrow \quad \frac{\dot{A}_t^h}{P_t} = i_t^d \cdot d_t + i_t^* \cdot b_t^h + \varepsilon_t \cdot b_t^h + \Omega_t^f + w_t l_t + \tau_t - c_t$$

On the other side,

$$\dot{A}_t^h = \dot{D}_t + E_t \cdot \dot{B}_t^h + \dot{E}_t \cdot B_t^h$$

$$\Rightarrow \quad \frac{\dot{A}_t^h}{P_t} = \dot{d}_t + d_t \cdot \pi_t + \dot{b}_t^h + b_t^h \cdot \pi_t^* + \varepsilon_t \cdot b_t^h$$

Therefore

$$\dot{a}_t^h = \dot{d}_t + \dot{b}_t^h = (i_t^d - \pi_t) d_t + (i_t^* - \pi_t^*) b_t^h + \Omega_t^f + w_t l_t + \tau_t - c_t$$

$$\Rightarrow \quad \dot{a}_t^h = (i_t^* - \pi_t^*)a_t^h - (i_t^* + \varepsilon_t - i_t^d)d_t + \Omega_t^f + w_t l_t + \tau_t - c_t$$

$$\Rightarrow \quad \int_0^\infty [\dot{a}_t^h - (i_t^* - \pi_t^*)a_t^h]e^{-rt}dt = \int_0^\infty [\Omega_t^f + w_t l_t + \tau_t - c_t - (i_t^* + \varepsilon_t - i_t^d)d_t]e^{-rt}dt$$

Here we impose TVC, $\lim_{t\to\infty} a_t^h e^{-rt} = 0$, and a_0^h is the initial financial assets of the household. Then we can get the lifetime budget constraint.

$$a_0^h + \int_0^\infty (\Omega_t^f + w_t l_t + \tau_t)e^{-rt}dt = \int_0^\infty [c_t + (i_t^* + \varepsilon_t - i_t^d)d_t]e^{-rt}dt$$

A.1.2 Firms

Firms need to borrow from banks Z_t and Z_t^* to pay for the wage for labors and a part of the payment for imported foreign inputs.

$$Z_t = W_t l_t$$

$$Z_t^* = \alpha P_t^{m*} n_t$$

where W_t is the nominal wage of labor, which is equal to $P_t \cdot w_t$, and P_t^{m*} is the international price of imported inputs. This price is exogenously determined in foreign goods market.

In real terms, they can be rewritten as:

$$z_t = w_t l_t$$

$$z_t^* = \alpha p_t n_t$$

Firm's nominal financial wealth is:

$$A_t^f = E_t B_t^f - Z_t - E_t Z_t^*$$

It can be rewritten in real terms as:

$$a_t^f = b_t^f - z_t - z_t^*$$

On one side,

$$\dot{A}_t^f = E_t \cdot i_t^* \cdot B_t^f + \dot{E}_t \cdot B_t^f - i_t^l \cdot Z_t - E_t \cdot i_t^{l*} \cdot Z_t^* - \dot{E}_t \cdot Z_t^* + P_t \cdot y_t - W_t l_t - E_t \cdot P_t^{m*} \cdot n_t - P_t \cdot \Omega_t^f$$

$$\Rightarrow \quad \frac{\dot{A}_t^f}{P_t} = i_t^* b_t^f + \varepsilon_t b_t^f - i_t^l z_t - i_t^{l*} z_t^* - \varepsilon_t z_t^* + y_t - w_t l_t - p_t n_t - \Omega_t^f$$

On the other side,

$$\dot{A}_t^f = E_t \dot{B}_t^f + \dot{E}_t B_t^f - \dot{Z}_t - E_t \dot{Z}_t^* - \dot{E}_t Z_t^*$$

$$\Rightarrow \quad \frac{\dot{A}_t^f}{P_t} = \dot{b}_t^f + b_t^f \pi_t^* + \varepsilon_t b_t^f - \dot{z}_t - z_t \pi_t - \dot{z}_t^* - z_t^* \pi_t^* - \varepsilon_t z_t^*$$

Therefore,

$$\dot{a}_t^f = \dot{b}_t^f - \dot{z}_t - \dot{z}_t^* = (i_t^* - \pi_t^*) b_t^f - (i_t^l - \pi_t) z_t - (i_t^{l*} - \pi_t^*) z_t^* + y_t - w_t l_t - p_t n_t - \Omega_t^f$$

$$\Rightarrow \quad \dot{a}_t^f = (i_t^* - \pi_t^*) a_t^f + (i_t^* + \varepsilon_t - i_t^l) z_t + (i_t^* - i_t^{l*}) z_t^* + y_t - w_t l_t - p_t n_t - \Omega_t^f$$

$$\Rightarrow \quad \int_0^\infty [\dot{a}_t^f - (i_t^* - \pi_t^*) a_t^f] e^{-(i_t^* - \pi_t^*)t} dt$$

$$= \int_0^\infty [y_t - w_t l_t - p_t n_t - \Omega_t^f - (i_t^l - i_t^{l*} - \varepsilon_t) z_t - (i_t^{l*} - i_t^*) z_t^*] e^{-(i_t^* - \pi_t^*)t} dt$$

After imposing the TVC: $\lim_{t \to \infty} a_t^f e^{-(i_t^* - \pi_t^*)t} = 0$, we have the firm's lifetime budget constraint:

$$\int_0^\infty \Omega_t^f e^{-(i_t^* - \pi_t^*)t} dt = a_0^f + \int_0^\infty [y_t - w_t l_t - p_t n_t - (i_t^l - i_t^{l*} - \varepsilon_t) z_t - (i_t^{l*} - i_t^*) z_t^*] e^{-(i_t^* - \pi_t^*)t} dt$$

A.1.3 Banks

Bank's nominal assets are:

$$A_t^b = Z_t + E_t Z_t^* + \delta_t D_t - D_t - E_t B_t^b$$

It can be rewritten in real terms as:

$$a_t^b = z_t + z_t^* - (1-\delta_t)d_t - b_t^b$$

On one side,

$$\dot{A}_t^b = 0 \cdot \delta_t D_t + i_t^l Z_t + i_t^{l*} E_t Z_t^* + \dot{E}_t Z_t^* - i_t^d D_t - E_t i_t^* B_t^b - \dot{E}_t B_t^b - P_t \cdot \Omega_t^b - P_t \cdot [(Ad_t^\rho + Bz_t^\rho)^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho}]$$

$$\Rightarrow \quad \frac{\dot{A}_t^b}{P_t} = i_t^l \cdot z_t + i_t^{l*} z_t^* + \varepsilon_t z_t^* - i_t^d d_t - i_t^* b_t^b - \varepsilon_t b_t^b - \Omega_t^b - [(Ad_t^\rho + Bz_t^\rho)^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho}]$$

On the other side,

$$\dot{A}_t^b = \delta_t \dot{D}_t + \dot{Z}_t + \dot{E}_t Z_t^* + E_t \dot{Z}_t^* - \dot{D}_t - \dot{E}_t B_t^b - E_t \dot{B}_t^b$$

$$\Rightarrow \quad \frac{\dot{A}_t^b}{P_t} = \dot{z}_t + z_t \pi_t + \dot{z}_t^* + z_t^* \pi_t^* + z_t^* \varepsilon_t - (1-\delta_t)(\dot{d}_t + d_t \pi_t) - \dot{b}_t^b - b_t^b \pi_t^* - b_t^b \varepsilon_t$$

Therefore

$$\begin{aligned} \dot{a}_t^b &= \dot{z}_t + \dot{z}_t^* - (1-\delta_t)\dot{d}_t - \dot{b}_t^b \\ &= (i_t^l - \pi_t) z_t + (i_t^{l*} - \pi_t^*) z_t^* - (i_t^d - \pi_t) d_t - \pi_t \delta_t d_t - (i_t^* - \pi_t^*) \cdot b_t^b \\ &\quad - \Omega_t^b - [(Ad_t^\rho + Bz_t^\rho)^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho}] \end{aligned}$$

$$\Rightarrow \quad \dot{a}_t^b = (i_t^* - \pi_t^*) a_t^b + (i_t^l - i_t^* - \varepsilon_t) z_t + (i_t^{l*} - i_t^*) z_t^* - (i_t^* + \varepsilon_t)\delta_t d_t - (i_t^d - i_t^* - \varepsilon_t) d_t - \Omega_t^b - [(Ad_t^\rho + Bz_t^\rho)^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho}]$$

$$\Rightarrow \quad \int_0^\infty [\dot{a}_t^b - (i_t^* - \pi_t^*) \cdot a_t^b] e^{-(i_t^* - \pi_t^*)t} dt = \int_0^\infty [(i_t^l - i_t^* - \varepsilon_t) z_t + (i_t^{l*} - i_t^*) z_t^* - (i_t^* + \varepsilon_t)\delta_t d_t - (i_t^d - i_t^* - \varepsilon_t) d_t - \Omega_t^b - [(Ad_t^\rho + Bz_t^\rho)^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^\rho)^{1/\rho}] e^{-(i_t^* - \pi_t^*)t} dt$$

$$\int_0^{\infty} \Omega_t^b e^{-rt} dt =$$

$$\Rightarrow \quad a_0^b + \int_0^{\infty} [(i_t^l - i_t^* - \varepsilon_t) z_t + (i_t^{l*} - i_t^*) z_t^* - (i_t^* + \varepsilon_t)\delta_t d_t - (i_t^d - i_t^* - \varepsilon_t) d_t$$
$$- [(A d_t^{\rho} + B z_t^{\rho})^{1/\rho} + (C z_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}] e^{-rt} dt$$

A.1.4 Government

The nominal assets of government is:

$$A_t^g = E_t B_t^g - \delta_t D_t$$

In real terms:

$$a_t^g = b_t^g - \delta_t d_t$$

On one side,

$$\dot{A}_t^g = i_t^* E_t B_t^g + \dot{E}_t B_t^g - P_t \tau_t + P_t [(A d_t^{\rho} + B z_t^{\rho})^{1/\rho} + (C z_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}]$$

$$\Rightarrow \quad \frac{\dot{A}_t^g}{P_t} = i_t^* b_t^g + \varepsilon_t b_t^g - \tau_t + [(A d_t^{\rho} + B z_t^{\rho})^{1/\rho} + (C z_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}]$$

On the other side,

$$\dot{A}_t^g = \dot{E}_t B_t^g + E_t \dot{B}_t^g - \delta_t \dot{D}_t$$

$$\Rightarrow \quad \frac{\dot{A}_t^g}{P_t} = \varepsilon_t b_t^g + \dot{b}_t^g + b_t^g \pi_t^* - \delta_t \dot{d}_t - \delta_t d_t \pi_t$$

$$\Rightarrow \quad \dot{a}_t^g = \dot{b}_t^g - \delta_t \dot{d}_t$$
$$= (i_t^* - \pi_t^*) b_t^g + \pi_t \delta_t d_t - \tau_t + [(A d_t^{\rho} + B z_t^{\rho})^{1/\rho} + (C z_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}]$$

$$\Rightarrow \quad \dot{a}_t^g = r \cdot a_t^g + (i_t^* + \varepsilon_t)\delta_t d_t - \tau_t + [(A d_t^{\rho} + B z_t^{\rho})^{1/\rho} + (C z_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}]$$

$$\Rightarrow$$

$$\int_0^{\infty} (\dot{a}_t^g - ra_t^g)e^{-rt}dt =$$

$$\int_0^{\infty} \{(i_t^* + \varepsilon_t)\delta_t d_t - \tau_t + [(Ad_t^{\rho} + Bz_t^{\rho})^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}]\}e^{-rt}dt$$

$$=>$$

$$\int_0^{\infty} \tau_t e^{-rt}dt =$$

$$a_0^g + \int_0^{\infty} \{(i_t^* + \varepsilon_t)\delta_t d_t + [(Ad_t^{\rho} + Bz_t^{\rho})^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}]\}e^{-rt}dt$$

A.1.5 Equilibrium Conditions

$$\begin{aligned}
&\dot{a}_t^h + \dot{a}_t^f + \dot{a}_t^b + \dot{a}_t^g = \dot{b}_t^h + \dot{b}_t^f - \dot{b}_t^b + \dot{b}_t^g \\
&= ra_t^h - (i_t^* + \varepsilon_t - i_t^d)d_t + \Omega_t^f + \Omega_t^b + w_t l_t + \tau_t - c_t \\
&\quad + ra_t^f + (i_t^* + \varepsilon_t - i_t^l)z_t + (i_t^* - i_t^{l*})z_t^* + y_t - w_t l_t - p_t n_t - \Omega_t^f \\
&\quad + ra_t^b + (i_t^l - i_t^* - \varepsilon_t)z_t + (i_t^{l*} - i_t^*)z_t^* - (i_t^* + \varepsilon_t)\delta_t d_t \\
&\quad - (i_t^d - i_t^* - \varepsilon_t)d_t - \Omega_t^b - [(Ad_t^{\rho} + Bz_t^{\rho})^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}] \\
&\quad + ra_t^g + (i_t^* + \varepsilon_t)\delta_t d_t - \tau_t + [(Ad_t^{\rho} + Bz_t^{\rho})^{1/\rho} + (Cz_t^{*\rho} + D(b_t^b)^{\rho})^{1/\rho}]
\end{aligned}$$

$$\begin{aligned}
=> \quad \dot{a}_t^h + \dot{a}_t^f + \dot{a}_t^b + \dot{a}_t^g &= \dot{b}_t^h + \dot{b}_t^f - \dot{b}_t^b + \dot{b}_t^g \\
&= r(b_t^h + b_t^f + b_t^b + b_t^g) + y_t - p_t n_t - c_t
\end{aligned}$$

$$=> \quad \dot{k}_t = rk_t + y_t - p_t n_t - c_t$$

A.2 The Domestic and External Shocks to the Economy

From the F.O.C.s of the agents in the economy, c_t, z_t, z_t^* and w_t can be expressed in the following equations:

$$\frac{1}{\lambda c_t} - 1 - \phi[\delta_t(i_t^* + \varepsilon_t) + A(Ad_t^{\rho} + Bz_t^{\rho})^{\frac{1-\rho}{\rho}} d_t^{\rho-1} - (1-\delta_t)D(Cz_t^{*\rho} + D(b_t^b)^{\rho})^{\frac{1-\rho}{\rho}}(b_t^b)^{\rho-1}] = 0 \qquad \text{(B1)}$$

$$[(\frac{z_t^*}{\alpha p_t})^{\frac{\sigma-1}{\sigma}} + (\frac{z_t}{w_t})^{\frac{\sigma-1}{\sigma}}]^{\frac{1}{\sigma-1}}(\frac{z_t^*}{\alpha p_t})^{-\frac{1}{\sigma}} - p_t\{1 + \alpha[C(Cz_t^{*\rho} + D(b_t^b)^{\rho})^{\frac{1-\rho}{\rho}} z_t^{*\rho-1} + D(Cz_t^{*\rho} + D(b_t^b)^{\rho})^{\frac{1-\rho}{\rho}}(b_t^b)^{\rho-1}]\} = 0 \qquad \text{(B2)}$$

$$[(\frac{z_t^*}{\alpha p_t})^{\frac{\sigma-1}{\sigma}}+(\frac{z_t}{w_t})^{\frac{\sigma-1}{\sigma}}]^{\frac{1}{\sigma-1}}(\frac{z_t}{w_t})^{-\frac{1}{\sigma}}-w_t[1+B(Ad_t^{\rho}+Bz_t^{\rho})^{\frac{1-\rho}{\rho}}z_t^{\rho-1}+D(Cz_t^{*\rho}+D(b_t^b)^{\rho})^{\frac{1-\rho}{\rho}}(b_t^b)^{\rho-1}]=0 \quad \text{(B3)}$$

$$w_t-\frac{1}{\lambda}-z_t=0 \quad \text{(B4)}$$

Chapter 2: Transmission of Monetary Policy via Domestic and Foreign Banks in Emerging Economies

2.1 Introduction

As foreign bank penetration has become increasingly sizable in emerging markets since the late 1990s, a natural question that emerges among not only economists but also central bankers is the following: could the transmission of monetary policy be different through domestic and foreign banks? Would the monetary policy have different distributional effects across foreign and domestic banks? If foreign banks respond less to host country monetary policy changes, then the effectiveness of the monetary policy of the host countries will be attenuated given an increasing number of foreign banks in the host banking sector.

This paper examines whether monetary policy shocks are transmitted differently by foreign and domestic banks, which is equivalent to examining whether an active bank lending channel of monetary policy transmission exists. The implication could be critically important for economists to understand the relevance of bank lending channel in transmitting monetary shocks, to help answer the question whether foreign bank penetration in emerging economies leads to more credit volatility, and also for central bankers in the recipient countries to conduct appropriate monetary policy.[26]

The transmission channels of monetary policy have been intensively debated in

[26] Another related implication, although beyond the scope of this paper, is that the borrowers of foreign and domestic banks might be affected differently due to banks' difference sensitivity to monetary policy. If domestic banks are more responsive, their dependent firms would be more affected than the borrowers of foreign banks. In the case that domestic banks mainly serve small businesses, these small firms may be seriously affected by monetary policy and cause some other problems, for example, a rise in unemployment rate. Therefore to understand the heterogeneity between foreign and domestic banks in response to monetary policy is really a critical question to not only economists but central bank decision makers.

literature. Economists generally agree that at least four channels existing to transmit the monetary policy shocks into the real side of economy: the interest rate channel, the exchange rate channel, the other assets price channel and the bank credit channel.[27] In the first three channels, no special role of banks has been designed. Banks have only a passive role since by assumption they could frictionlessly substitute alternative forms of liabilities thereby monetary policy shocks would have no supply-side effects on their credit provision. After the pioneering work by Bernanke and Blinder (1988), the bank lending channel has received considerable attention from economists. The bank lending channel theory assumes that the bank loans and other forms of liabilities (such as bonds) are not perfect substitutes for firms, which have to depend on banks for investment finance, and deposits and other forms of liabilities (such as equities) are not perfect substitutes for banks either. When the central bank tightens the money supply, it extracts banks' reserves and reduces their deposits. Since banks can not perfectly substitute deposits with other liabilities, loan supply has to be reduced, which affects firms' investment and then output.[28] The bank lending channel theory explains how a nominal monetary shock affects the real side of economy through the shock transmission via banks' non-trivial behavior.[29]

[27] In the interest rate channel literature, when the central bank carries out contractionary monetary policy, the nominal interest rate rises, leading to a rise in the real interest rate (at least for a short time) because of sticky prices, which in turn affects firms' investment decision and output in the economy. The exchange rate channel focuses on the changes in exchange rate due to the changes in monetary policy and the relative price of domestic and foreign goods, and its effect on the net export and overall outputs. The other assets price channel argues that monetary policy can affect the price of assets such as land and stocks, which in turn affects firms' balance-sheet or consumers' lifetime income, leading to changes in investments or consumption.

[28] In the generally called "bank credit channel" there include the bank lending channel and the balance-sheet channel. The balance-sheet channel argues that a contractionary monetary policy will deteriorate firms' balance-sheet by reducing their cash-flow or their net worth, cause worse adverse selection and moral hazard problems, and lead to less credit from banks and lower investment. In our paper, we do not consider the effect of balance-sheet channel by assuming that the effect of monetary policy on credit demand is symmetric for all banks and then controlling for it in our regression model.

[29] Two additional things are worth emphasizing: first, the bank credit channel does not rule out the existence of interest rate channel or other transmission channels, the best way to describe its importance may be that it only

Some empirical evidence have been found consistent with this theory. An active bank lending channel means that banks with different characteristics respond differently to monetary policy shocks since they have different abilities to shield their loans.

In our paper, we find evidence that, consistent with the bank lending channel, foreign banks show smaller sensitivity to domestic monetary policy shocks than their domestic peers. When the central bank takes a tightening monetary policy, the effects are less pronounced for foreign banks in that they adjust down their loans by a smaller magnitude. This smaller sensitivity is found in both the short-run and the long-run. This finding suggests that host monetary policy might become less effective given an increasingly dominant foreign bank presence in the financial sector. At the same time, we study the determinants of the smaller sensitivity of foreign banks. Other studies before have found that the different pass-through of monetary policy is driven by banks' varying characteristics in liquidity, capitalization and size. In our paper, we move forward to study whether the difference in foreign and domestic banks' responses to monetary policy is also driven by some other relevant factors independent of the above characteristics. Our evidence suggests that even if foreign and domestic banks converge in those aspects, they would still display different sensitivity to host monetary policy. These findings are consistent with the internal capital market hypothesis, which suggests that foreign banks have access to an internal capital markets connecting to their parent banks overseas, and this internal capital market could help them to be isolated from the exogenous shocks in host

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amplifies the effect of interest rate channel; second, monetary policy can affect real outputs only in short-term. When prices adjust, outputs will return back to potential level, and in the long-term, monetary policy only affects the price level.

financial market. In addition, most of the studies on the bank lending channel focus on the banks in developed economies, and only a few in some individual emerging or developing economies. Our paper fills in this gap by examining whether an active bank lending channel generally exists in emerging economies. We construct and use a panel dataset of more than 1200 banks in the emerging economies of Eastern & Central Europe, Latin America and Asia over 1996 – 2003.

The rest of the paper is structured as follows. Section 2 reviews some relevant works on the effect of foreign bank penetration on bank credit stability. Section 3 describes our dataset and presents descriptive statistics; then econometric methodology and empirical results are presented in section 4. We extend our research briefly in section 5 and 6, while section 7 concludes.

2.2 Literature Review

Our paper contributes to the literature on bank lending channel of monetary policy transmission. The hypothesis of the bank lending channel is based on Bernanke and Blinder (1988) and Kashyap and Stein (1995). Many empirical works have been conducted to seek the evidence of its existence. Studies (at least early works) are mainly concentrated on industrialized countries, such as the U.S. (See Bernanke and Blinder (1992), Kashyap et al. (1993), Peek and Rosengren (1995), Hancock and Wilcox (1998), Kishan and Opiela (2000) and Kashyap and Stein (2000).) They find evidence in accordance with the existence of bank lending channel.[30] De Bondt (1998)

[30] Bernanke and Blinder (1992) and Kashyap et al. (1993) work with aggregate data. Although they find a monetary contraction tends to be followed by a reduction in aggregate bank credit, which can be interpreted as

finds evidence of bank lending channel in Germany, Belgium and Holland. Steudler and Zurlinden (1998) and Bichsel and Perrez (2004) detect a bank lending channel in Switzerland. Gambacorta (2005) tests the effectiveness of the bank lending channel in Italy. After Edwards and Végh (1997), researches are also examining the bank lending channel in emerging markets. Examples include: Agung (1998) for Indonesia, Alfaro et al. (2004) for Chile, Juks (2004) for Estonia, Mora (2005) for Mexico, and Arena et al. (2006) for Latin American and Asian countries. In many cases, evidence in line with the existence of bank lending channel are found.

The evidence consistent with an active bank lending channel is discovered through banks' cross-sectional difference in behavior, driven by their varying characteristics such as liquidity, capitalization and size, which are believed to be the main determinants of banks' ability to supply loans and thus response to monetary shocks. For example, Kashyap and Stein (1995) find different sensitivity across banks in different size. Small banks are more responsive to monetary policy shocks than big banks. Kashyap and Stein (2000) finds that more liquid banks exhibit higher lending growth, and the effects are stronger under contractionary monetary policy. An interpretation in accordance with the theory of bank lending channel is that, the impacts of contractionary monetary policy on banks' lending are stronger for less liquid banks since they can not easily sell off liquid assets to maintain loans. Kishan and Opiela (2000) find the distributional effects of monetary policy on bank loans

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consistent with the existence bank lending channel, it is also consistent with other transmission channels. Therefore their findings are not enough to explicitly identify bank lending channel out of other channels. Peek and Rosengren (1995), Hancock and Wilcox (1998) and Kashyap and Stein (2000) use bank level data and their results are in line with the existence of bank lending channel.

depend on capitalization and asset size.[31] Uncapitalized and small banks are more responsive to monetary shocks because they are unable to raise alternative funding under contractionary monetary policy. Gambacorta (2005) also finds heterogeneity in the monetary policy pass-through exists among banks with different level of capitalization and liquidity. However, it is worth emphasizing that these findings may not universally hold for any particular country. For example, Loupias et al. (2002) finds similar role played by liquidity as Kashyap and Stein (2000), but no significant impact by size and capitalization. Gambacorta (2005) finds no evidence of size to identify the distributional effect of monetary policy.

Efficiency might be another important factor to influence banks behavior as well. Jeon and Miller (2005), studying the performance of domestic and foreign banks in Korea, attributes better efficiency and governance identified for foreign banks to the better performance. They argue that foreign banks could achieve better efficiency and better asset and liability management since they rely on the governance of mother banks.

Although the above-mentioned bank characteristics are usually found to be important determinants of banks' lending behavior, they are likely not the end of the story. If banks converge in these characteristics, they are expected to have the same behavior. Our paper examines and finds this may not be true. Independent of banks' own balance-sheet strength, their affiliation with mother bank could be another determinant of their behavior but has been only scantly paid attention to. Houston and

[31] Peek and Rosengren (1995) and Hancock and Wilcox (1998) also find capital plays important role in determining banks' credit growth, but they did not distinguish asset size as another important factor.

James (1998) find that loan growth among banks affiliated with a multi-bank holding company is less sensitive to bank's cash flow, liquidity, and capital position when compared to unaffiliated banks. Ashcraft (2003) finds that stand-alone bank lending is sensitive to changes in the monetary policy while affiliated bank lending is largely unaffected. Gambacorta (2005) also finds that affiliated banks' loan growth is less sensitive to monetary shocks than unaffiliated banks. These papers suggest that mother banks can establish an internal capital markets to allocate capital among their subsidiaries, so affiliated banks have better access to alternative liabilities to smooth away the effects of policy-induced reduction in deposits on lending. Our paper, which studies banks' different behavior across their ownership, is quite close to this literature. Foreign banks, affiliated with their holding banks abroad, may take advantage of the internal capital markets to buffer the impacts of monetary policy on loans.[32] Our empirical evidence that ownership still plays relevant role in determining banks' responses to monetary policy, after other bank characteristics have been controlled for, is consistent with this hypothesis. De Haas and Naaborg (2006), by focused interviews with managers of foreign banks and their affiliates, finds that parent banks do use internal capital market to steer the credit of their subsidiaries in Eastern and Central Europe. When foreign banks could not raise enough funding, parent banks transfer capital to them in exchange for shares or debt titles.[33]

Our paper is also related to the literature that addresses the effects of foreign

[32] Different from Houston and James (1998), Ashcraft (2003) and Gambacorta (2005), which use data in one particular country, we use data across 35 countries. Our paper is more close to a test whether internal capital markets also exit between parent bank and its affiliated banks overseas.

[33] When a subsidiary could not raise new capital, it could receive funds from parent bank in exchange for (new) shares. When a subsidiary requires additional liquidity, parent bank may transfer funds in exchange for debt titles.

bank penetration on the credit stability in host countries. Some empirical studies have tried to address it, but provide mixed answers. A detailed review of the literature on this aspect has been provided in the first essay of the writer's thesis. Our evidence that monetary policy effects are less pronounced for foreign banks suggests foreign banks play a stabilizing role. A brief examination on the effects of foreign banks' home conditions also finds no evidence that foreign banks might transmit and propagate external shocks from their home country to the host markets.

According to our knowledge, Arena et al. (2006) is the only study that tries to identify the bank lending channel across foreign and domestic banks by comparing their response of loans, deposits and interest rates to the changes in monetary conditions. Although they find some evidence that foreign banks have lower sensitivity of credit, their evidence is very weak. Using more extensive dataset, which includes not only Latin American and Asian but also Eastern & Central European countries, we find more evidence that support foreign banks' lower sensitivity to monetary policy shocks.

2.3 Data

We construct our unbalanced panel dataset with both bank-level and macroeconomic data. The bank-level data are from Bureau van Dijk's BankScope database, which has been frequently used in many empirical researches. BankScope earns its reputation by comprehensive coverage of banks in large number of countries. Many researchers have documented the coverage of BankScope data (For example,

Claessens et al. (2001)). Arena et al. (2006) also mentioned a second advantage to using BankScope database in that the accounting items are presented in standardized form after being adjusted for differences in accounting and reporting standards across countries.

Series are composed of 6850 yearly observations, covering 1273 banks in 35 countries in Eastern & Central Europe, Latin America and Asia during the period 1996-2003. The sample includes all major countries in the above-mentioned continents.[34] Table 2.1 reports the number of domestic and foreign banks of each country over the years in our dataset. Only commercial banks are selected in the dataset to reduce the possible biased results from different nature and business scope among banks in different specializations. That is, there is no investment banks, corporative banks, real estate & mortgage banks, medium & long term banks, saving banks, security houses (but likely under the name of bank), non banking credit institutions, and specialized governmental credit institutions included in our dataset. Although this selection may reduce the number of our observations, its advantage is worth taking this cost.

<Table 2.1>

The identification of foreign banks is one of the most important steps in our study. A bank is defined as "foreign" if more than 50% of its assets are owned by

[34] Eastern & Central European countries include: Albania, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Slovak Republic, Slovenia and Ukraine. Latin American countries are: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela. Asian economies include: Hong Kong SAR, India, Indonesia, Korea, Malaysia, Singapore, Philippines, and Thailand.

foreign individuals, firms (including banks) or international organizations.[35] Different from the identification in Arena et al (2006), we do not only classify the banks from industrialized OECD countries as "foreign". Any bank whose owner is not from the host country is treated as "foreign".[36] BankScope records the ownership of bank only in the latest year when data are updated, so we have to resort to various sources to pin down the ownership status of the banks in every year during 1996-2003. The steps we take, basically following Arena et al (2006), are: first, we review bank's profile of historical evolution on its website. If a bank has experienced international ownership change, it usually highlights it in the profile; second, we depend on another database, SDC Platinum, where comprehensive merger & acquisition information are recorded, to trace back when a domestic bank is acquired by foreigners; third, if by following these two steps we are unable to identify the ownership of the bank, we resort to various other information sources, such as banks' annual reports, central banks' publication and news reports available on the internet. To identify government-owned banks we follow the same methods. Two dummies are constructed to capture bank's ownership. The first is the international ownership dummy (FOREIGN) which is equal to 1 for the years the bank was foreign-owned, 0 otherwise.[37] To divide government- and private-owned within domestic banks, we constructed the second dummy (STATE) which is equal to 1 if the (domestic) bank is owned by the government and 0 otherwise.

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[35] In our dataset, some banks are owned by European Bank of Reconstruction and Development (EBRD).

[36] For example, some Argentinean banks also operate in Brazil, such as Banco de la Nacion Argentina. In Arena et al (2006) they are not "foreign" banks because Argentina is not a member of OECD, but in our paper and in reality, they are.

[37] That is, for a bank which was initially domestic but acquired by foreigners later, we marked it 0 in the dummy FOREIGN when it was domestic, and in and since the year when it was bought, we marked it 1.

Another important separation of banks is between subsidiaries and branches of foreign banks. After talking with an expert from BankScope, we are informed that currently only subsidiaries are included in the database, so we do not have to make distinction between these two forms of affiliation of foreign banks. The exclusion of foreign bank branches from BankScope prevents us from detecting the different monetary policy responses attributable to different forms of affiliation.

Another issue in data collection is that some reports are provided by BankScope in both unconsolidated and consolidated form. As much as possible we use unconsolidated reports. We use the consolidated ones only when there are no unconsolidated reports provided or we miss important data in unconsolidated reports.[38] In our dataset 418 observations are consolidated figures.

Banks' interest rates on loans and deposits are among the variables of most interest for us, but unfortunately they are not reported in BankScope. We approximate the yearly average loan interest rate by interest income over total earning assets, and the deposit interest rate by interest expenses over deposits & short-term funding. In reality, banks charges different loan interest rates for loans with different maturities, and deposits rates also vary with different terms of deposits, and the short-term interest rate may have somewhat different sensitivity to monetary shocks from long-term rate, so our interest rate series are no doubt imperfect. However, since the limitation of our data, this is the best solution we can ever reach.

Outliers were removed based on the following criteria. First, we dropped the

[38] We have to use many consolidated reports for Hong Kong's banks, since in unconsolidated they usually report no interest income and interest expenses, which are critical for us to calculate loan and deposit interest rates.

observations with negative values for total assets, total earning assets, loans, deposits, or equities. These negative values could only be interpreted as errors in the database. 156 observations were removed this way. Second, we calculated the growth rate in total assets, loans and deposits. 224 observations were eliminated where the growth rate in total assets exceeded 200%, or the growth rate in loans and deposits exceeded 300%.[39] Third, we deleted the observations where either loan interest rate or deposit interest rate is above 500%, considering that in some countries financial crisis might cause banks to rise up their interest rate hugely. 31 observations were eliminated this way. Fourth, we removed 308 observations in which total assets, or loans, or deposits were missing. Finally, we deleted the banks which did not have at least 2 successive year observations, that is, 71 observations. After the data cleaning, we have 6850 observations left in the dataset.

The macro variables are from the International Financial Statistics (IFS). When the needed series are not available from IFS, we extract them from the economy's central bank website.[40] We select macroeconomic series of not only host, but also home countries. The series include: Treasury bill rate, money market rate, discount rate, GDP, CPI, and exchange rate (end-of-period and period-average). A critical work is to select the appropriate monetary policy indicators, which have been presented in Table 2.2 for all host and home countries. Our criteria are: we first choose Treasury bill rate for every country. If this rate is not available, or it has fewer observations than money market rate, we choose money market rate. If both rates are not available,

[39] Arena et al (2006) follows the same criteria to drop the outlier in the growth rate of total assets, loans and deposits.
[40] We did this in the case of Taiwan. All macro data are from its central bank's website.

we consider discount rate.[41] Although it might be better to match the monetary policies in host and home country in foreign bank's observations, assuming foreign banks' behavior is not only affected by host country's monetary policy but also home country's monetary policy, the constraints in the data sources stops us from doing that.

<Table 2.2>

Before moving forward to the econometric part, we want to find out whether domestic and foreign banks have some different features at a quick glance. We do this by presenting the descriptive statistics in Table 2.3, first pooling all bank-level observations, and then separate by regions: Eastern & Central Europe, Latin America and Asia. Domestic banks are then divided into state- and private-owned. We report then t-test in Table 2.4 for the significance of the difference between domestic and foreign banks in some important aspects. We also show the correlation between our main variables including monetary policy indicator, to take a quick detection if monetary policy may be associated with the changes in these variables.

<Table 2.3> <Table 2.4>

Some interesting facts emerge from the descriptive statistics. Firstly, foreign banks have higher liquidity and capitalization degree. Foreign banks display a higher ratio of liquid assets over total assets, and at the same time, it has a higher ratio of loans over total assets as well.[42] Foreign banks depend relatively less on deposits but

[41] One problem for discount rate as our monetary policy proxy is that it may not vary over years. For example, in India's case, we do not have Treasury bill rate and only few data in money market rate, and the discount rate does not vary between 1997-1998 and 1999-2000, therefore we had to go to India's central bank's website, extract the weighted average call money market rate and use it as our indicator of monetary policy. Similar story takes place in Slovak Republic, where we have no Treasury bill rate and only few money market rate data, and the discount rate remains constant for 5 years, so we used the Slovak Republic's central bank website to calculate the average 3 month Bratislava interbank offered rate as its monetary policy proxy.

[42] Depending on different reporting criteria amongst countries, there are two different definitions on liquid assets

more on equities than domestic banks, and this difference is significant. This may be interpreted as consistent with the imperfect substitution between deposits and other external funding, and may imply foreign banks have better access to other funding sources other than deposits, and these sources are likely to be less affected by monetary policy. When we separate our observations across continents, this finding still holds in Latin America and Asia, but the opposite in Eastern & Central Europe. This may be associated with the entry mode of foreign banks. Merger & Acquisition foreign banks are more dependent on deposits but less on equities. In Eastern & Central Europe, 115 out of the total 202 foreign banks entered through merger & acquisition, while in Latin America only 90 out of 233, and in Asia 38 out of 114 foreign banks are established through take-over. This implies that Merger & Acquisition foreign banks inherit some features from their predecessors.

Secondly, foreign banks are more efficient than domestic banks. The efficiency is measured by non interest expenses over average assets, which is smaller for foreign banks. This evidence is consistent with many studies that conclude foreign banks are more cost-efficient. Combined with the above significant difference in liquidity and capitalization, this confirms the need to hold these characteristics constant first if we want to examine whether there is some other relevant factors in determining banks' behavior.

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in our BankScope data. The "narrow" definition includes: cash and equivalent, deposits and loans to banks with less than three months to run to maturity and quoted/listed government bonds known by the analyst responsible to be realizable within three months; the "broad" measure includes: cash & equivalent, deposits with banks (all), loans to banks (all), deposits with central banks & governmental authorities (all), and other securities. Overall, liquid assets is the assets allocated as opposed to loans, and is used to indicate how much assets a bank owns to buffer a run on the bank. The fact that foreign banks have both higher ratios of loans and liquid assets relative to total assets might imply that foreign banks have less fixed assets, equity investment (such as investments in subsidiaries and associates) and other assets.

Thirdly, it seems difficult to conclude that there is any explicitly different pattern in interest rates between domestic and foreign banks. Overall, domestic banks charge lower loan interest rate and also offer lower deposits interest rate in terms of the mean value. However, this pattern changes when we consider the median, in that foreign banks charge lower median loan interest rate and offer lower median deposits interest rate. We strongly suspect that the former result might be due to the inevitable effects of big values on the mean. In both Eastern & Central Europe and Asia, foreign banks charge lower loan interest rate than their domestic peers. Only in Latin America, the opposite pattern is found, but Latin America is the continent where banks have once charged and offered huge interest rates because of financial crises.

Fourthly, in terms of the growth rate of total assets, loans and deposits, domestic banks display higher growth rate than foreign banks, although the differences are not significant. This might imply foreign banks are more stable, or less aggressive to expand their business.

Fifthly, within domestic banks, state-owned banks show different operation behavior from their domestic private counterparts. State-owned banks depend more on deposits but they show weaker ambition to provide more loans, indicated by smaller ratio of loans relative to total assets and the higher ratio of liquid assets relative to total assets. State-owned banks charge significantly lower interest rate on loans, but their interest rate paid on deposits is not significantly smaller, resulting in a much smaller interest rate spread, lower net interest margin and return on average assets. The impressive difference between state-owned banks from domestic private

banks implies that state-owned banks may be unable to really maximize their profits by market-orientation. It also highlights that we have to treat them separately in the analysis.

<Table 2.5>

Finally, the correlation table (Table 2.5) gives us the association between the allocation of bank assets, interest rate and the monetary policy in host countries. When banks allocate more assets into loans, they have to reduce the holding of liquid assets, which is indicated by the strong negative association between the ratio of loans / total assets and liquid assets / total assets. Similarly, when banks depend more on deposits on their liability side, they need less equities, so the correlation between deposits / total assets and equity/total deposits is also negative. When there is a contractionary monetary policy, both the interest rates of loans and deposits increase, as showed by the positive association between the monetary policy indicator and bank interest rates. The ratio of loans to total assets varies negatively with monetary policy, and similarly for the ratio of deposits to total assets. The growth rates of loans and deposits are also negatively associated with monetary policy, indicating that banks would slow down or decrease their loans supply, and collect less deposits. The allocation of bank assets into liquid assets is positively associated with monetary policy, but the association seems weak. The ratio of equity to total assets also increases with contractionary monetary policy, implying that banks have to resort to other funding sources to offset the decrease in deposits.

When we group our observations into domestic and foreign banks, their

correlation with monetary policy seems different. The negative correlation between monetary policy and loans and deposits is smaller in foreign banks than domestic banks. Growth rates of loans and deposits in foreign banks seem less affected by monetary policy. Meanwhile, the liquidity and equity in foreign banks are also less correlated with monetary policy. It may imply the weaker effects of monetary policy on foreign banks' balance sheet. However, the association between interest rates and monetary policy is stronger for foreign banks than for the domestic counterparts, which once again might be due to the potential bias in approximating these interest rates.

2.4 Empirical results

2.4.1 Pooled OLS model

We first construct a pooled OLS model as our bench framework.

The general form of our pooled OLS model is as follows:

$$gr_{i,j,t} = \alpha_0 + \sum_{s=1}^{2} \alpha_s \cdot gr_{i,j,t-s} + \sum_{s=0}^{1} \beta_s \cdot \Delta mp_{j,t-s} + \phi \cdot foreign_{i,j,t} + \sum_{s=0}^{1} \eta_s \cdot foreign_{i,j,t} \cdot \Delta mp_{j,t-s}$$
$$+ \theta \cdot state_{i,j,t} + \sum_{s=0}^{1} \varphi_s \cdot state_{i,j,t} \cdot \Delta mp_{j,t-s} + \delta \cdot other\ characteristics_{i,j,t}$$
$$+ \gamma \cdot \sum_{s=0}^{1} other\ characteristics_{i,j,t} \cdot \Delta mp_{j,t-s} + \xi \cdot macro_{j,t} + country\ effect_{i,t} + year\ effect_{i,j} + u_{i,j,t}$$

where

$gr_{i,j,t}$ is the percentage loan supply (deposit collection) growth of bank i (in country j) in year t relative to t-1. Two year lag are included in the regressors on the RHS to capture the persistence of the dependent variable. The reason we include two instead of one year lag is that, in the loans there are not only short-term loans which

are due in one year but also long-term ones that have longer maturity, therefore only one year lag will not be sufficient to capture the persistence of dependent variable caused by its longer components. For deposits, there are not only demand deposits but also term deposits that may have a term longer than one year. To analyze the response of liquid assets, we also regressed the percentage growth rate of liquid assets on the same explanatory variables. The only difference is we include only one year lag of the growth rate of liquidity, since liquidity is hold for buffer stock purpose and mainly composed of cash and short term securities.

α_0 is the intercept term;

$\Delta mp_{j,t}$ is the change in the monetary policy of country j, which is equal to the first order difference of the monetary indicator in year t relative to year t-1; one year lag of $\Delta mp_{j,t}$ is also included because credit contracts between banks and their borrowers may cause banks' response to be shown only with a lag.

$foreign_{i,j,t}$ and $state_{i,j,t}$ are two dummies to distinguish bank's ownership status and divide banks into three categories: domestic private banks (which is the benchmark), domestic state-owned and foreign-owned.

$other\ characteristics_{i,j,t}$ is a matrix of banks' other characteristics, which includes: bank's *liquidity* (represented by the ratio of liquid assets to total assets), *capitalization* (represented by the ratio of equities to total assets), *bank size* (indicated by the bank's loan over total domestic credit)[43] and *efficiency* (by the ratio of non

[43] We do not try to normalize our bank size proxy, like Gambacorta (2005), Arena et al (2006) and many others. The reason is that any attempt to normalization will cause bias since we hardly collects all banks' total assets data in every single year. Missing values are inevitable in BankScope database.

interest expenses to total assets).[44] To reduce the potential endogeneity of these control variables, we use their one-year lag values.

We add the dummies $foreign_{i,j,t}$ and $state_{i,j,t}$ and the other characteristics variables' interaction term with $\Delta mp_{j,t}$ and $\Delta mp_{j,t-1}$ as well. A significant coefficient η_s will imply there are some other relevant factors, independent of banks' own financial strength, that leads to banks' different monetary policy responses, which is consistent with the internal capital market hypothesis.

$macro_{jt}$ is the matrix of host country macro economic variables, including real GDP growth rate, inflation rate, and currency depreciation rate. Assuming that the loan demand of the domestic banks is not systematically different from that of foreign banks, these variables help to control the variation in credit demand of borrowers.

country effect and *year effect* are also included in some cases to capture some national cultural factors, and the average trend in other factors, that may affect banks' operations.

$u_{i,j,t}$ is the error term.

$\alpha_0, \alpha_s, \beta_s, \phi, \eta_s, \theta, \varphi_s, \delta, \gamma, \xi$ are the coefficients (or coefficient vectors) that we are going to estimate.

i = 1, 2, … N which indicates a specific bank i;

j = 1, 2, … J indicating a particular country j;

t = 1, 2,… T indicating a particular year t.

The most important assumption of pooled OLS lies in the distribution of the

[44] Non interest expenses include the expenses on overheads and loan loss provision.

error term u_{ijt} and its correlation with explanatory variables.[45] It is assumed that $u_{ijt} \sim IID(0, \sigma_u^2)$ and $E(\mathbf{x}_t' u_{ijt}) = \mathbf{0}$. Avoiding a stronger assumption that $E(u_{ijt} \mid \mathbf{x}_1, \mathbf{x}_2, ...\mathbf{x}_T) = 0$, which is more likely to fail in reality, this contemporaneous exogeneity assumption only restricts that the error term is not correlated with the explanatory variables in the contemporaneous year, or in other words, it allows the correlation between the error term and the explanatory variables for year $t \neq s$. Although this contemporaneous exogeneity can not guarantee our estimated coefficients are unbiased, it is enough for the purpose of asymptotic consistency. The inclusion of lags of dependent variable causes no harm to pooled OLS since we also assumed no autocorrelation in the error term. However, the contemporaneous exogeneity assumption is also an obvious drawback to applying pooled OLS in our case. In this framework, we implicitly assume there are no unobserved bank characteristics, which are correlated with contemporaneous independent variables. This assumption may fail if we think about bank's ambition or managers' personality, which may persist over years and correlates the error term with contemporaneous explanatory variables. If this is the case, the pooled OLS estimators will be biased and inconsistent.

The empirical results from pooled OLS are provided in Table 2.6. Although only working as our starting framework, pooled OLS still displays some interesting results.

<Table 2.6>

First, we find evidence for the effects of monetary policy on banks' loan and

[45] The assumption that there is no linear relationship between explanatory variables is reasonably held.

deposit growth, which in most cases are statistically significant. The negative coefficients for $\Delta mp_{j,t}$ and $\Delta mp_{j,t-1}$ indicate that banks will reduce the growth rate of their loans and deposits when central bank conducts contractionary monetary policy.[46] Banks may not immediately respond to the monetary policy shock but with one year lag, or the effect of the monetary policy could last for more than one year. These results are consistent with the hypothesis of credit channel.

Second, the usual negative and significant coefficient of $foreign_{i,j,t}$ shows foreign banks on average have lower growth rate in loans and deposits than domestic private banks.[47] In general the interaction variables $foreign_{i,j,t} * \Delta mp_{j,t}$ and $foreign_{i,j,t} * \Delta mp_{j,t-1}$ show positive sign in line with a priori expectations and are significant in many cases.[48] This indicates that foreign banks adjust their growth rate of credit and deposit by smaller extent, resulting in lower sensitivity to monetary policy. For example, the results in Table 2.6 column (5) implies that, an unexpected contractionary shock on monetary policy (raising the indicator by 1 percentage point) will cause a contemporaneous decrease in average loan growth rate of domestic private banks by 0.57%, while foreign banks in the same period will reduce it by only 0.15% (and is not significantly different from zero). Similarly, a 1 percentage point contractionary monetary policy shock may reduce the average deposit growth rate of domestic private banks by 0.50%, while foreign banks in the same period would

[46] In Eastern & Central Europe, the effects of monetary policy show the expected negative sign but are statistically insignificant in many cases. One explanation is that the foreign capital inflow compensates the policy-induced drop of loans and deposits.

[47] In Eastern & Central Europe, foreign banks have a higher average growth rate of loans and deposits. This might be related with the rising FDI in this region.

[48] The correlation between $\Delta mp_{j,t}$ and $\Delta mp_{j,t-1}$ is -0.19. This weak correlation rules out the possible serious multicollinearity induced by these two regressors.

reduce it by only 0.21% (and is only marginally significant). Even after adding interaction explanatory variables to control for possible transmission channels of monetary policy via other characteristics, the estimated coefficients are quite stable in terms of sign and value. It implies that foreign banks dampen the effects of monetary policy due to some reasons other than their liquidity, capitalization, bank size and efficiency. Consistent with Ashcraft (2003), this supports the importance of internal capital market between foreign banks and their parent banks. Foreign banks' adjustment of liquid assets also implies that they may have alternative sources of funding from internal capital market. A tightened money supply might increase or hold domestic private banks' liquid assets, since they need to keep liquidity to prevent a run on bank. Foreign banks are found that they raise their liquid assets by a smaller extent or even reduce them, suggesting they are less constrained to alternative funding sources.

In Latin American countries, foreign banks show significantly different and weaker response to monetary policy changes as opposed to domestic private banks in both loans and deposits. Based on the results from Table 2.6 column (5), 1 percentage point increase in monetary policy indicator would reduce the contemporaneous loan growth rate by 0.64% for domestic private banks, while for foreign banks only by 0.14%. Deposit growth rate in the same period would decrease by 0.86% for domestic private banks, while for foreign banks by only 0.38%. In Asia, foreign banks do not show different response in loans although their deposits growth is significantly slower. In Eastern & Central Europe, although the difference is not statistically significant,

the signs imply that foreign banks do not adjust down their loans more even when their deposit growth becomes lower than that of domestic private banks. This evidence supports the argument that foreign banks can play a stabilizing role in host country.

In general, the loan growth rate of state-owned banks would increase, rather than decrease, contemporaneously when central bank conducts tightening monetary policy. The growth of deposits follows the same manner. This deviation might imply that the credit relationship between state-owned banks and their clients is not sensitive to external monetary shocks, or state-owned banks are more easily interfered by the government to provide credit to some particular firms when monetary condition becomes contractionary.

Third, bank's other characteristics show expected signs in most cases, although not always significant. Consistent with Kashyap and Stein (2000), more liquid banks show higher average growth in loans. This can be explained by the fact that more liquid banks could increase or maintain their growth of loans by drawing down the holding of liquid assets. Liquid banks also show that they have significantly slower growth in deposits. This is because banks will have less incentive to collect deposits when they allocate relatively less assets to loans. More capitalized banks, having better access to alternative sources of liabilities, could also have higher growth rate of deposits. This can be explained by the fact that higher capitalization could be interpreted by markets as lower risk of the bank. More capitalized banks have quicker shortfall in deposits when central bank conducts tightening monetary policy,

indicating less importance of deposits for them to finance loans. Bank size in some cases shows its damping effects to monetary policy shocks, and this is consistent with Kishan and Opiela (2000). Efficiency does not show statistically significant results in many cases, but it seems that more efficient banks achieve higher growth. The fact that only a few characteristic-monetary policy interaction terms are significant may imply that the transmission of monetary policy via bank characteristics is heterogeneous across different countries. It may imply that in some countries liquidity plays an important role in determining banks' response while in some other countries capitalization and bank size may be more important. When we pool these countries together, the effects from these bank characteristics "on the average" disappear.

Fourth, the growth rate of real GDP is in general a determinant of the growth of loans and deposits. Higher growth in GDP, representing the increase in credit demand, is associated with higher credit growth. This is consistent with the dependence of firms on banks to finance their investment. Higher inflation in general reduces firms' credit demand, since firms will be reluctant to borrow more loans when they expect the real return of their investment will be reduced. Currency depreciation in many cases also reduces banks' lending. The positive coefficient of depreciation for deposits could be explained by valuation effects, that is, the foreign currency's value in terms of local currency "rises" with worse currency depreciation. This coefficient is statistically significant in Eastern and Central Europe where dollarization is intense.

We also calculated the long-run multiplier of the monetary policy shock on the

growth rate of loans and deposits, which measures the cumulative effect of one unit shock of monetary policy. The results are provided in Table 2.7. The calculation is mainly based on the specification (3) and (5) shown in Table 6. Specification (3) allows the multipliers to be easily given by: $\sum \beta_s /(1-\sum \alpha_s)$ for domestic private banks, $\sum \eta_s /(1-\sum \alpha_s)$ (where η stands for the coefficients for $foreign_{i,j,t} * \Delta mp_{j,t}$ and $foreign_{i,j,t} * \Delta mp_{j,t-1}$) representing the difference between foreign banks and domestic private banks in response, and $(\sum \beta_s + \sum \eta_s)/(1-\sum \alpha_s)$ is the overall effect of monetary policy shock on foreign banks in the long run. When specification (5) is employed, the long-run multiplier of monetary policy for domestic private banks is given by $(\sum \beta_s + \sum \gamma \cdot \overline{characteristics}_{t-1})/(1-\sum \alpha_s)$, where γ represents the coefficients of the interaction terms of bank characteristics and monetary policy. $\overline{characteristics}$ is the mean value of the bank characteristics. The difference of foreign banks in response is the same, and the overall effect of monetary policy on foreign banks is therefore $(\sum \beta_s + \sum \gamma \cdot \overline{characteristics}_{t-1} + \sum \eta_s)/(1-\sum \alpha_s)$. In most cases, these two specifications provide us with similar long-run multipliers.[49] The standard error is calculated by employing delta method.

<Table 2.7>

[49] The only exception is Eastern & Central Europe, where the calculated long-run multipliers show large difference. One reason might be the high correlation between the year and country effects and other explanatory variables. If we exclude the year and country effects, the calculated long-run multiplier for growth rate of loans is -1.5007. The high correlation between year and country effects and other macro-variables are found in some cases, for example, the correlation between depreciation and year1999 is 0.4661, the correlation between Belarus country effect and inflation is 0.5934, between Belarus country effect and depreciation is 0.4409. Another reason is the high correlation between monetary indicator and their interaction terms with bank characteristics. If we further exclude the interaction of capitalization and monetary policy, the calculated long-run multiplier is equal to -1.0068, which is very close to the calculated long-run multiplier -0.9214 based on specification (3). Without dropping year and country effects, the difference would remain large even if we remove either the interaction of monetary policy with liquidity or capitalization or both. This reminds us that we need to be very cautious to regard the long-run multiplier of monetary policy for European banks.

Monetary policy shock, in general, has significant contractionary effects on loans and deposits for both domestic private banks and foreign banks. Foreign banks display significant difference by adjusting the growth rate of loans at a slower pace. Based on the specification (5), 1 percentage point increase in the monetary policy indicator would cumulatively reduce the growth rate of loans and deposits of domestic private banks by 1.75% and 1.01%, but only by 0.91% and 0.75% for foreign banks. After dividing our samples across regions, we find that only in Asia foreign banks are more actively adjusting their loans and deposits, while in Eastern & Central Europe and Latin America, the effects of contractionary monetary policy were larger for domestic private banks. The magnitude of our long-run multipliers is comparable with Gambacorta (2005), which helps to ensure our results are less likely deviant.[50] We also find that monetary policy has significant long-run effect on both foreign and domestic private banks. Foreign banks, as the "affiliated banks" in Gambacorta (2005), show more sluggishness to adjust down their loans under contractionary monetary policy. The fact that the long-run multiplier of one unit shock in monetary policy is greater than the impact multiplier implies that banks would take some time to adjust their portfolio allocation, or in other words, the *total* effect of monetary policy could be observed by only the long-run multiplier.

The counterintuitive behavior of foreign banks in Asia is driven by the banks in Indonesia. The reason lies on that Indonesian bank system collapsed in the 1997

[50] Gambacorta (2005) found the long-run multiplier of monetary policy on the growth of lending of Italian banks is -1.350. He also compared his results with some others. de Bonte found the long-run multiplier is -1.398 using BankScope database. These comparable magnitudes help us to believe our calculated long-run multiplier makes good sense.

Southeastern Asian crisis. Indonesian government conducted banking restructuring program to rebuild the banking system, which has been seen costly and slow.[51] Considering that the malfunctioning banking system might lead to biased results, we re-estimated the model after removing the observations from Indonesia (149 out of 903 observations in Asia), and the new results are shortly reported in Table 2.8. Monetary policy still imposes negative effects on the growth of loans and deposits in most cases (contemporaneously and with a lag), but not statistically significant. Foreign banks show significantly different behavior by reducing much less or even increase their loans, which is consistent with what we found in general. In the long-run, one unit increase in monetary policy indicator would reduce the loan growth of Asian domestic private banks cumulatively by around 2%, still close to the long-run multiplier with Indonesian observations. However, foreign banks do not show negative response to contractionary monetary policy. The long-run multiplier for foreign banks in Asia becomes positive, although not significantly different from zero. This might imply that foreign banks are taking over the market share from domestic banks. With regards to deposits, they are reduced in both domestic private banks and foreign banks, but the reduction in foreign banks is much smaller both contemporaneously and in a long run, although not statistically significant. To summarize, after removing Indonesian observations, our results are consistent with

[51] According to our knowledge, Indonesia is the only victim in 1997 Southeastern Asian crisis whose banking system collapsed. To rebuild its banking system, Indonesian government closed 48 unviable banks, merged 4 state-owned banks, and recapitalized 19. The restructuring program cost Indonesia government a large part of its revenue, and so reduced government expenditure on other public projects. For example, in 1998-99, the public debt for restructure banking system took 42.8% of the government revenue. The economic recovery process is slow partly because of the vulnerabilities of Indonesia fundamentals and partly because of political uncertainties. In 2003, its real GDP just recovered to the pre-crisis level.

those in general and in Eastern & Central Europe and Latin America.

<Table 2.8>

The long-run multiplier of monetary policy on the growth rate of loans and deposits for state-owned banks is equal to around 0.80% and 0.43%, but they are statistically insignificant. The lack of significant response of state-owned banks to monetary policy reflects the non-market orientation of these banks.

Interest rate is another important aspect to observe the different response of foreign and domestic banks. Gambacorta (2007) argues that the effect of monetary tightening on bank interest rates should be more pronounced for small, low-liquid and low-capitalized banks. In our paper, we are more interested to find whether banks with different ownership show different response in interest rates. If foreign banks could have more capacity to shield their credit relationship under contractionary monetary policy, they should adjust their interest rates by a smaller amount.

<Table 2.9>

We regressed the first order difference of interest rates on the same explanatory variables except the dependent variable which enters with only one year lag. The reason why we choose only one year lag is that first order difference of interest rate is less likely showing a persistence of more than one year. Initially we got very counterintuitive results shortly provided in Table 2.9, which indicate that foreign banks would increase their interest rates (of loans and deposits) by significantly higher extent than domestic private banks. Since foreign banks are less sensitive to cut down their loans when central bank conducts contractionary monetary policy, the

results only imply a disconnection between banks' interest rates and loans. The results are found to be driven by the foreign banks in Latin American countries, while in Eastern & Central Europe foreign banks do not show any difference in adjusting interest rates and in Asia foreign banks increase their interest rates by a significantly smaller extent. The reasons we have counterintuitive results might lie on that, first, the approximate interest rates is far from perfect since it at best could be only regarded as an "average" rate for various loans and deposits with different maturities; these interest rates in reality have different response and sensitivity to monetary shocks; second, the effect of large values in our approximated interest rates may be too strong to be ignored. Most of the large interest rates are from three countries: Brazil in 1999, Paraguay in 2002-2003, and Uruguay in 2002-2003, which reflect the banking crises in these three countries.[52] After refining our data by dropping the interest rates that are higher than 100%, and by this eliminating most crisis years, we re-ran the regression and obtained the results reported in Table 2.10, which are consistent with our previous finding on the loan and deposit growth rates.

<Table 2.10>

In general, the responses of interest rates only provide limited evidence for the existence of a bank lending channel and the different transmission via foreign and

[52] Brazil's 1998 crisis was triggered by investors' expectation that Brazil would eventually devaluate the *real*. Capital flight reached $28 billion in 1998, which caused the central bank to raise interest rates in an effort to slow it. Banks might also lose reserves due to the capital flight, and were forced to increase their interest rate greatly. The crises in Paraguay and Uruguay in 2002-2003 were believed a repercussion of Argentine crisis, plus their own domestic economic and political problems. In Uruguay, for example, the exports of goods to Argentina fell by 70% in 2002, and tourism from Argentina fell a half. This considerable contraction in Uruguay's economy led to a massive run on banks by depositors. The government was forced to freeze banking operations. In total approximately 33% of the country's deposits were taken out of banks. In Paraguay, exports to Argentina fell by two-thirds during only the first months in 2002. The banking system was seriously affected and triggered sizable deposits outflows. The currency *guarani* depreciated by 34% against U.S. dollar.

domestic banks. A contractionary increase in monetary policy indicator by 1 percentage point would contemporaneously raise the loan interest rate of domestic private banks by around 0.35 percentage points, while foreign banks would increase it by approximately 0.06 percentage points less. In terms of deposit interest rate, domestic private banks would increase it by 0.28 percentage points, while foreign banks would increase it by 0.02 less. However, foreign banks do not show any significant difference in adjusting their interest rates in general and in Eastern & Central Europe and Latin America. Only in Asia, foreign banks raise their interest rates by a significantly smaller extent than domestic private banks. A one percentage point increase in the monetary policy indicator would contemporaneously raise the loan and deposit interest rate of Asian domestic private banks by 0.48 and 0.45 percentage points respectively, while foreign banks would raise them by only 0.22 and 0.30.

Most of other parameters show the expected signs, although only some of them are significant. Higher capitalized banks would raise their interest rates less, since they are less dependent on deposits to finance their loans. Big banks also have smaller increase in interest rates in most cases, which might be due to their advantage in larger networks to collect deposits and contact with customers, although this effect is not always statistically significant. Less efficient banks also tend to raise their interest rates by smaller extent. The reason is that banks with higher loan loss provision could be more expansionary to provide credit. Liquidity does not show conclusive effect on the behavior of interest rates.

Among the macroeconomic variables, the growth in GDP reduces the rise in the loan interest rate. Depreciation increases the loan and deposit interest rates, but this effect is mainly driven by Latin American countries. In Eastern & Central Europe and Asia, depreciation has the opposite effect. The reason might be that the depreciation of the domestic currency encourages banks to provide more foreign currency services which could lower the interest rates. Inflation in Eastern & Central Europe and Asia raises the interest rates of loans and deposits.

2.4.2 Panel VAR model

We move forward by using panel vector autoregression (panel VAR) method to examine the dynamics of banks' adjustment.[53] The reasons are: firstly, it is difficult distinguish the response of loans from monetary policy from its response to shocks in deposits or liquid assets in pooled OLS framework;[54] secondly, our pooled OLS model has assumed that there are no unobserved bank characteristics correlated with contemporaneous independent variables, which might be too strong to be held.

The advantage of panel VAR lies on its combination of traditional VAR approach and panel data methodology to address the above issues. It treats all variables in the system as endogenous, and by the orthogonalized impulse-response functions, it can trace out the response of one variable (say *growth rate of loans*) to an orthogonalized shock in another variable (say *monetary policy*), holding other shocks

[53] Our approach is close to Love and Zicchino (2002).
[54] It would result in inconsistent estimates if we put contemporaneous *deposits* or *liquid assets* on the RHS in pooled OLS, since the allocation of *loans* and *liquid assets* and the collection of *deposits* could be determined at the same time.

(in *growth rate of deposits* or *growth rate of liquid assets*) constant. At the same time, it allows for unobserved individual heterogeneity in banks. To start, we specify a reduced-form VAR model as follows:

$$z_{ijt} = \Gamma_0 + \Gamma_1 z_{ijt-1} + f_i + e_{ijt}$$

where z_{ijt} is a vector, $\{\Delta mp_{jt}, grdeposits_{ijt}, grlq_{ijt}, grloans_{ijt}\}$ where Δmp_{jt} is the change in the monetary policy indicator in country *j* at time *t*, $grdeposits_{ijt}, grlq_{ijt}$ and $grloans_{ijt}$ respectively represent the growth rate of deposits, liquid assets and loan by bank *i* in country *j* at time *t*. f_i is the unobserved bank-fixed effect, and e_{ijt} is the error term.

To identify the impulse response functions, a restriction on the structural form of the VAR has to be imposed first, which conventionally is adopted by assuming a particular ordering of the variables in terms of their effects to others. The variables that come earlier are assumed to affect the following ones contemporaneously and with a lag, while the variables that come later could only affect the earlier ones with a lag. In our case, a change in monetary policy affects banks' deposits, liquidity and loans contemporaneously and with a lag. Deposits affect liquidity and loans contemporaneously and as well as with a lag, but liquidity and loans could affect deposits only with a lag. Banks' operation could affect the monetary policy only with a lag. Two assumptions are implicitly made here: the effect of monetary policy falls symmetrically upon all banks; and the central bank would adjust its monetary policy according to banks' behavior.

The fixed effects, f_i, are removed by forward mean-differencing, which is often

referred to as the Helmert procedure (Arellano and Bover (1995)).[55] Then the reduced-form VAR is estimated by system-GMM, and the impulse-response functions are derived. Standard errors of the impulse-response functions are computed using Monte-Carlo simulations. To compare the responses of foreign banks and domestic banks, we divide our samples into two datasets according to bank ownership.[56]

The results of the estimation of the reduced-form VAR by system GMM is provided in Table 2.11. For both domestic private banks and foreign banks, the response of loans and deposits to monetary policy is negative as expected, indicating that contractionary monetary policy will reduce both loans and deposits. The impact of monetary policy is almost twice larger in domestic private banks than foreign banks. For domestic private banks, the sensitivity of loans to deposits is significantly positive, implying loans and deposits would move in the same direction, while for foreign banks, the sensitivity is not significant although it is positive as expected.

<Table 2.11>

Our particular interest concentrates on the impulse response of loans and deposits to monetary policy shocks, which are provided in Table 2.12 and graphically reported in Figure 2.1. Loans and deposits both fall with the shock of contractionary monetary policy, but the largest contraction is observed one year later. This indicates the friction of financial markets to adjust portfolio allocation with the changes in monetary condition. Banks might be unable to reduce their loans immediately because

[55] When a lag of the dependent variable is on the RHS, a simple mean-differencing to remove the fixed effects will cause biased estimates, since the demeaned explanatory variable will be correlated with the demeaned error term.

[56] Domestic state-owned banks are eliminated from our samples, because by using GMM method, too many observations for them are lost.

of their credit contracts with clients. The effect of monetary policy shock continues to be significant for approximately three years.

<Table 2.12>

<Figure 2.1>

In comparison to domestic private banks, foreign banks clearly show smaller response in loans and deposits, especially contemporaneously and one or two years later. For example, to one standard deviation shock in monetary policy, domestic private banks reduce the growth rate of loans by nearly 3% contemporaneously while foreign banks only by 1% (and not significantly different from zero). In the following year, domestic private banks adjust down the growth of loans by more than 6%, while foreign banks only by 4.7%. The differences in the response are significant in both years. Even in the third year, foreign banks still show smaller adjustment than domestic private peers, although the difference loses significance. In terms of the growth of deposits, similar pattern is shown. The growth rate of deposits in foreign banks is adjusted less than domestic private banks. The different impulse responses between domestic private and foreign banks are illustrated in Figure 2.2 (differencing "domestic private" by "foreign"). Since the response of loans and deposits are negative for both domestic and foreign banks, the differences that are significantly smaller than zero indicate the weaker response in foreign banks. Easily seen from Figure 2.2, the differences are usually significant. [57]

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[57] We also tried to extend the lag length to 2 years, so our reduced-form VAR is slightly modified to:

$$z_{ijt} = \Gamma_0 + \Gamma_1 z_{ijt-1} + \Gamma_2 z_{ijt-2} + f_i + e_{ijt}$$

Generally, the response of loans and deposits follow the same pattern as the earlier model. Foreign banks are

<Figure 2.2>

As an alternative specification, we include the growth rate of GDP in our model, and keep the same ordering except that we put the growth rate of GDP earlier than monetary policy. The results are not changed qualitatively, although some values change in magnitude.

2.5 Further Analysis: Home Country Effect and Entry Mode

2.5.1 Foreign banks' home country effect

In this section, we provide a brief study on the effect of home country conditions on foreign banks' behavior in host countries, which helps to answer the question whether foreign banks may play a destabilizing force in the host countries by transmitting and propagating the shocks from their home countries. At the same time, it also tests whether the weaker response of foreign banks to host monetary policy is only a reflection of the effects of their home country conditions. The distribution of foreign banks by home countries is reported in Table 2.13.

<Table 2.13>

Firstly, we extend our pooled OLS model by allowing for the effect of home country's monetary policy (contemporaneously and with a lag), growth of real GDP,

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still less responsive contemporaneously and one year later. However, in the second and third year, the effects on loans and deposits become positive, which seems counter-intuitive. There might be some explanations. An econometric explanation might be that the error terms could not be really orthogonalized, so the shocks in the monetary policy might be negatively correlated with some other shocks that might increase the loans. For example, when central bank conducts tightening policy, the increased interest rate might attract more capital inflows from outside for higher return, which offset the loss of deposits and may cause an increase of loans. Unfortunately, without data to control this possibility, the above explanation can hardly be tested. Another explanation might be that some banks would fail under tightening monetary condition. They either closed their operation, or were absorbed or merged by other banks. The survived banks then might take over their market share and the credit of loans would increase.

and inflation, respectively, indicated by the interaction terms $foreign_{i,j,t}$ * $home\ \Delta mp_{k,t}$, $foreign_{i,j,t}$ * $home\ \Delta mp_{k,t-1}$, $foreign_{i,j,t}$ * $home\ gr(gdp)_{k,t}$, and $foreign_{i,j,t}$ * $home\ inflation_{k,t}$. The results are shortly reported in Table 2.14. We find only limited evidence that foreign banks are affected, with a lag, by their home country monetary policy, but no evidence that they may transmit the shocks from their home output growth or inflation. A contractionary monetary policy in home country may increase foreign banks' growth rate of loans in host countries, consistent with the hypothesis of internal capital market, since a tightening monetary policy in home country would reduce banks' loans there and drive them to shift capital to their overseas subsidiaries. However, with or without the fixed effects for home countries, the coefficient on $foreign_{i,j,t}$ * $home\ \Delta mp_{k,t-1}$ is only marginally significant, so it does not provide strong support for the sensitivity of foreign banks in host countries to shocks in their home country.

<Table 2.14>

The coefficients on the interaction term $foreign_{i,j,t}$ * $\Delta mp_{j,t}$ and $foreign_{i,j,t}$ * $\Delta mp_{j,t-1}$ are only slightly changed in value, and significance remains. This implies that our earlier results are robust and not driven by the effects from foreign banks' home country.

Secondly, we also include home country conditions into our panel VAR model. Assuming that home country monetary policy may contemporaneously and with a lag affect host country monetary policy and foreign banks' loans, while host monetary

policy and foreign banks' loans could only affect home monetary policy with a lag,[58] we find no evidence that foreign banks' loans are significantly affected by home monetary policy while the significant effect from domestic monetary policy does not change. These results are provided in Figure 2.3. Consistent with the results in the pooled OLS model, foreign banks' loans may increase under a tightening monetary policy in their home countries, but this increase is not statistically significant in all periods. We also try some alternative specifications,[59] and the results are qualitatively the same. In all cases we find no significant increase of foreign banks' loans in host countries attributable to a shock in their home country monetary policy or other home condition. Meanwhile the magnitude and significance of foreign banks' response to domestic monetary policy are not undermined.

<Figure 2.3>

Overall, we do not find strong evidence that foreign banks play a destabilizing role in host countries by propagating the shocks from their home countries. The results in this section at best only provide a weak support on foreign banks' sensitivity to home monetary policy. In addition, after allowing for home conditions, our earlier results do not change.

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[58] The intuition here is that the monetary policy in home countries, which are usually more advanced economies, will spill its effect over to affect the monetary policy in host countries. This spill-over is observed in Figure 4 in that a tightening monetary policy in home countries is associated with a contraction of monetary policy in host countries. However, host countries' monetary policy has no significant effect on home countries' monetary policy as expected.

[59] These alternative specifications include adding home country real GDP growth rate and foreign bank's deposits. We also tried to use the difference between host country and home country monetary policy, instead of the two variables separately. The results are similar and no evidence is found that foreign banks show significant response to home country monetary policy. When home country monetary policy is tightened more relative to host country monetary policy, foreign banks significantly increase their loans in host countries. All these results are available upon request.

2.5.2 Foreign bank entry mode

In this part, we briefly study how the entry mode affects foreign banks' behavior in host countries. The distribution of foreign banks by entry mode is reported in Table 2.15, and the descriptive statistics for these two types of banks in Table 2.16.

<Table 2.15> <Table 2.16>

We constructed two dummy variables, $greenfield_{i,j,t}$ and $takeover_{i,j,t}$, respectively for foreign banks de novo established and via merger & acquisitions. Therefore our sample is divided into four categories: domestic private banks (which is the benchmark), domestic state owned banks, greenfield foreign banks and takeover foreign banks. The interaction terms of greenfield banks and takeover banks with domestic monetary policy, $greenfield_{i,j,t} * \Delta mp_{j,t}$, $greenfield_{i,j,t} * \Delta mp_{j,t-1}$, $takeover_{i,j,t} * \Delta mp_{j,t}$ and $takeover_{i,j,t} * \Delta mp_{j,t-1}$ are also included to observe whether and how foreign banks with different entry mode may show different responses to domestic monetary policy. The pooled OLS results are reported in Table 2.17.

<Table 2.17>

In most cases, both greenfield and takeover foreign banks show positive sign on the interaction term coefficients, which implies that both of these two types of foreign banks may have smaller sensitivity to host monetary policy than domestic private banks. Different entry mode would not cause opposite behavior across foreign banks in responding to host monetary policy shocks. In addition, the significantly smaller sensitivity of takeover foreign banks relative to domestic private banks is consistent with that the change in lending is driven by the force on supply side instead of

demand side, since takeover foreign banks could have similar borrowers to domestic banks.

However, for greenfield foreign banks, their different response from domestic private banks is not statistically significant. We also tested and found that, although the coefficient on $takeover_{i,j,t}*\Delta mp_{j,t}$ does not significantly differ from that on $greenfield_{i,j,t}*\Delta mp_{j,t}$, the coefficient on $takeover_{i,j,t}*\Delta mp_{j,t-1}$ is significantly larger than that on $greenfield_{i,j,t}*\Delta mp_{j,t-1}$, suggesting that takeover foreign banks may be more stable than greenfield peers under a host monetary shock. We also reestimate our panel VAR model by separating our sample into greenfield and takeover foreign banks, and the result is qualitatively similar to the pooled OLS model. In most periods, both greenfield and takeover banks show smaller response than domestic private banks. Greenfield foreign banks are found more sensitive to domestic monetary policy than takeover foreign banks in the second, third and fourth periods. We represent their impulse response graphically in Figure 2.4.

<Figure 2.4>

This finding raises the question why takeover foreign banks are relatively less sensitive than their greenfield counterparts. To answer this question, we first need to understand what each entry mode implies for banks' behavior. Entry mode might imply the different integration degrees of banks with their mother institutions, which leads to a common belief that greenfield banks should be more closely integrated with their mother banks. If this is true, greenfield foreign banks are probably less responsive to host country monetary policy shocks. However, this belief needs to be

carefully examined. Only entry mode *by itself* can not necessarily guarantee different linkage degree between mother banks and their subsidiaries. It may also indicate the cost of entry or the strategy of operation. In addition, entry mode might also indicate the familiarity of the management group to local market. The management groups in takeover banks are likely more familiar to the host market, and it helps these banks to partially offset the shocks from monetary policy. Therefore entry mode might mean more than just the integration degree between mother and subsidiary banks. At this moment we hardly conclude the explicit determinants of takeover foreign banks' weaker sensitivity, and this finding could serve as a start for an extension of our research in the future.

2.6 Foreign bank penetration level and monetary policy effects: evidence from aggregated data

In this section, we examine the stabilizing force of foreign banks in credit provision under monetary policy shocks by using aggregated data. We find that the effects of monetary policy on banking sector total loans are dampened in the economies with higher foreign bank penetration level. This result is consistent with the evidence found from bank-level data.

The model is as follows:

$$\begin{aligned} gr(loans)_{j,t} = {} & \beta_0 \cdot gr(loans)_{j,t-1} + \beta_1 \cdot \Delta mp_{j,t} + \beta_2 \cdot \Delta mp_{j,t-1} \\ & + \alpha_0 \cdot peneta_{j,t} + \alpha_1 \cdot peneta_{j,t} * \Delta mp_{j,t} + \alpha_2 \cdot peneta_{j,t} * \Delta mp_{j,t-1} \\ & + \lambda \cdot other\ financial\ \text{var}iables + \eta \cdot macroeconomic\ \text{var}iables + u_{j,t} \end{aligned}$$

where $gr(loans)_{j,t}$ is the growth rate of banking sector total loans in country j in year t,

$\Delta mp_{j,t}$ and $\Delta mp_{j,t-1}$ represent contemporaneous and one year lag monetary policy. $peneta_{j,t}$ represents foreign bank penetration level in terms of total assets, and $peneta_{j,t}*\Delta mp_{j,t}$ and $peneta_{j,t}*\Delta mp_{j,t-1}$ represent their interactions with monetary policy.

The other financial sector variables are included to control the factors that may affect the growth of total loans in the banking sector. $sbsta_{j,t}$ represents the market share of state-owned banks in the banking sector, and $sbsta_{j,t}*\Delta mp_{j,t}$ and $sbsta_{j,t}*\Delta mp_{j,t-1}$ are their interaction with monetary policy. $concenta_{j,t}$ means the concentration level of the largest three banks in the banking sector, and $concenta_{j,t}*\Delta mp_{j,t}$ and $concenta_{j,t}*\Delta mp_{j,t-1}$ follow the same syntax. $lqta_{j,t-1}$ means the weighted average liquidity of all banks in the banking sector, and $equityta_{j,t-1}$ the weighted average capitalization level of all banks in the banking sector[60]. To reduce the possible endogeneity problem, one year lag is used instead of their current values. We use $niraaall_{j,t-1}$, net interest revenue over average assets for all banks, to measure the competition level in the banking sector, following Claessens et al (2001) in the sense that banks' net interest revenue relative to total assets is reduced when the market is more competitive. The interaction terms of above variables with monetary policy are also included. $domcredit_{j,t}$ is the total banking sector credit divided by GDP, representing the bank dependence level of the host countries. $llploans_{j,t-1}$ represents the weighted average bank loan loss provision relative to total loans. This variable is used to measure the overall riskiness in the banking market. It is interacted with $peneta_{j,t}$ since foreign banks may have different responses to market risk. We also

[60] Liquidity and capitalization are weighted by individual banks' share in the banking sector in terms of their total assets.

include some macroeconomic variables to control the effects on total loans from demand side, such as $inflation_{j.t-1}$ and $gr(GDP)_{j,t-1}$. Their interactions with $peneta_{j,t}$ are added to distinguish foreign banks' possible different response to shocks in demand. Several dummies for crisis are also included. The dummy $crisis_{j,t}$ is designed by following Cull and Martinez Peria (2007) for countries in crisis periods, and four alternative crisis dummies, $asiacrisis_{j,t}$, $bracrisis_{j,t}$, $ruscrisis_{j,t}$ and $argcrisis_{j,t}$, are constructed to distinguish the crisis period for affected countries specifically in 1997 Southeast Asia crisis, 1998 Brazil crisis, 1998 Russia crisis and 2000 Argentina crisis.

All the aggregated data, such as $peneta_{j,t}$, $sbsta_{j,t}$, $concenta_{j,t}$, $lqta_{j,t-1}$, $equityta_{j,t-1}$, $niraaall_{j,t-1}$ and $llploans_{j,t-1}$, are constructed based on the bank-level data. For example, $peneta_{j,t}$, is calculated by aggregating all foreign banks' total assets and dividing it over the total banking assets in the host country. The other variables follow similar construction method.

<Table 2.18>

The results are provided in Table 2.18. $\Delta mp_{j,t}$, and $\Delta mp_{j,t-1}$ in some cases, is significantly negative, indicating that the growth rate of banking sector total loans would decrease when the central bank conducts contractionary monetary policy. $peneta_{j,t}*\Delta mp_{j,t}$ is positive and significant at any conventional significance level in all specifications. This suggests that the effects of monetary policy, at least in the contemporaneous year, are less pronounced in economies with higher foreign bank penetration level.

For robust test purpose, we changed the variable $peneta_{j,t}$ alternatively by two

means. The first is measuring the foreign bank penetration level in terms of loans rather than total assets, and the second is using the foreign bank presence series calculated by Micco et al (2004)[61]. The results are shown in specification (11), (12) and (13). Both of these two new measures give us qualitatively same results as before. Higher foreign bank penetration level buffers the effect of monetary policy on credit growth. We also changed the variable $niraaall_{j,t-1}$ by using $nieaaall_{j,t-1}$, which is non-interest expenses over average assets for all banks to measure the competitiveness in the banking market, or $niraadom_{j,t-1}$, net interest revenue over average assets for only domestic banks, or $nieaadom_{j,t-1}$, non-interest expenses over average assets for only domestic banks. In Claessens et al (2001) it is argued that non-interest expenses decreases as the banking market competition increases, since domestic banks are stimulated to raise efficiency for their survival. The results remain qualitatively same after using these measurements.[62]

Some other interesting results are also revealed. Higher state-owned bank dominance in the banking sector tends to dampen the potency of monetary policy on credit growth, since state-owned banks are less market-oriented. Loan growth is smaller in countries where banking sector is more concentrated, but higher in better capitalized banking sector. Monetary policy is also less effective in better capitalized banking sector, consistent with Kishan and Opiela (2000). This might be due to that banks with higher capitalization have better alternative sources to substitute the

[61] Micco et al (2004) measure foreign bank penetration level in a more sophisticated way. For example, assuming in an economy there is only one bank, if 51% of total assets in this bank are owned by a foreign bank, they measure the foreign bank penetration level by 51%. In our paper, foreign bank penetration is measured as 100%.

[62] Even we change these competition variables by using the data from Beck et al (2000), net interest revenue over total earning assets and overcost over total assets, the results remain qualitatively same.

deposit loss under contractionary monetary policy, and therefore could stabilize their loan provision. It is interesting that monetary policy is more potent in more liquid banking market. One potential explanation is high liquidity may reflect poor health in small banks and they would increase their liquid assets (by reducing credit) to avoid a run on bank when monetary condition becomes tightening. Credit grows more quickly in more competitive banking market, and in some specifications it seems to suggest that monetary policy would be more pronounced in less competitive banking market. One reason could be banks are declined to reduce lending and lose market shares to their competitors.

2.7 Conclusion

Although studies on bank lending channel and foreign bank penetration are not uncommon, there are very few that explore the transmission of monetary policy in emerging economies via the bank lending channel across domestic and foreign banks. Our paper contributes to the literature on the bank lending channel in emerging economies, by going beyond the commonly considered characteristics of banks such as liquidity, capitalization, size and efficiency, and focusing on the difference in banks' ownership. Our paper also adds to the literature on the effects of foreign bank penetration on financial stability in the host countries. In addition, according to our knowledge, this is the first paper that examines the dynamic effects of monetary policy by applying panel VAR methodology.

This paper investigates the different transmission of the monetary policy via

domestic and foreign banks. By observing a large sample of more than 1200 banks in 35 emerging economies in Eastern & Central Europe, Latin America and Asia, our results suggest that heterogeneity in the monetary policy pass-through exists between domestic and foreign banks, consistent with the existence of an active bank lending channel. We find evidence that foreign banks are less sensitive to contractionary monetary shocks in host countries by lowering their loans and deposits less than domestic private banks, and this lower sensitivity is driven by some factors independent of banks' own liquidity, capitalization, size and efficiency. This finding is consistent with the hypothesis of internal capital markets between the foreign banks and their parent banks. Consistent evidence of less pronounced monetary policy in economies with higher foreign bank penetration level is also found by using aggregated data. Our findings highlight the stabilizing role that the foreign bank presence may play in host countries, and at the same time the potential tradeoff as monetary policy becomes less effective.

Chapter 3: Foreign Bank Penetration, Resource Allocation and Output Growth in Emerging Economies

3.1 Introduction

This paper is specifically interested in studying the implication of foreign bank penetration on resource allocation and economic growth in host emerging economies. Foreign bank penetration, bringing both benefits and concerns, may affect the economic growth directly and indirectly. Direct benefits may arise if foreign banks introduce additional capital into the host countries, energetically seek profitable uses for these funds and exert corporate control. By doing these, foreign banks may directly boost the efficiency of resource allocation in favor of accelerated economic growth.[63] Meanwhile, foreign bank penetration could achieve better resource allocation indirectly, by intensifying competition in the banking market and stimulating domestic banks to improve their efficiency in financial service. (Demirguc-Kunt, et al (1998)). So far, only little evidence is found that increasingly higher foreign bank penetration is directly associated with host countries' economic growth. More research have been conducted and found evidence that foreign bank penetration may accelerate economic growth indirectly by adding more competition and inducing the efficiency gains in the banking sector.

This paper addresses whether foreign banks' direct effect on resource allocation is relevant, after the competitiveness in the banking sector has been controlled. I specifically examine whether the effects of capital and labor on output growth would

[63] In the second essay of this thesis, I find that the level of foreign bank penetration level is not directly associated with higher lending growth rate in the banking sector.

be higher in economies with more pronounced foreign bank participation, given competitiveness and their interaction with capital and labor controlled. A positive answer would contribute an addition to the literature on the direct effect of foreign bank penetration in host economies, suggesting foreign banks tend to seek good borrowers and directly have resources allocated in the most productive sectors. It is worthwhile to note that, following Demirguc-Kunt et al (1998), the difference between the terms “direct” and “indirect” lies on that, foreign banks “directly” search and find good borrowers, and “indirectly” drive domestic bank to compete more actively. Both ways could have resources well allocated and produce higher output. The implication is that, besides stimulating higher competition in the banking sector, foreign bank penetration has relevant additional effects on better resource allocation.

Our finding suggests some evidence that higher foreign bank penetration may improve economic growth by having capital allocated to the most productive sectors. The effect of capital growth on output growth is higher in economies where foreign bank presence is more pronounced, which is interpreted as consistent with the hypothesis that foreign banks could help capital better allocated into most productive sectors. Even the effects from higher competitiveness in the banking market on capital allocation have been controlled, the higher effects of capital growth on output growth in highly foreign bank penetrated economies remain. However, no different effect of labor on output growth is discovered in economies with different foreign bank participation.

The reminder of the paper is organized as follows. Section two briefly reviews

the related literature. The next sector introduces the data and reports descriptive statistics. The forth section introduces the models used to test the role of foreign banks in improving resource allocation. The fifth section concludes.

3.2 Literature Review

This is paper is closely related with the literature of finance-growth nexus. It has been intensively debated whether financial development plays a relevant role in economic growth.[64] Financial system is important for economic growth in allocating capital, monitoring borrowers, exerting corporate control, facilitating risk management and so on.[65] The level of financial development is found positively associated with long-run economic growth (Goldsmith (1969), King and Levine (1993a and 1993b), De Gregorio and Guidotti (1995), Rajan and Zingales (1998) and Levine et al (2000), Beck et al (2004)).

However, the implication of foreign bank entry on economic growth is still far from conclusion. There is only limited works on the direct linkage between foreign bank entry and economic growth in host economies. The direct impact of foreign bank penetration could be from bringing additional capital into the host economies, energetically seeking profitable use for their funds, exerting corporate control and facilitating risk management. Demirguc-Kunt et al (1998) find no evidence that foreign banks directly influence long-run economic growth, but the increased

[64] Some influential economists believe that finance is a relatively unimportant factor in economic development. For example, Lucas (1988) said the relationship between financial and economic development is "badly over-stressed".

[65] The "financial system" in Levine (1996) includes not only banks, but a broad mix of financial instruments, markets and institutions.

participation of foreign banks tends to lower the probability of a banking crisis. Bayraktar and Wang (2006) find some evidence on both direct and indirect link between foreign bank presence and economic growth by observing 28 developed and developing countries.[66]

In contrast to limited works that find direct impact of foreign bank presence on economic growth, more works have been conducted and found foreign banks could indirectly foster higher economic growth by adding competition and improving the efficiency in the banking sector. Claessens et al (1997) find evidence that increasing foreign bank presence is associated with lower profits and costs in domestic banking sector, which reflects a higher competition and efficiency stimulated by foreign entry. Demirguc-Kunt et al (1998) find foreign bank penetration tend to render domestic banking sector more efficient, and economic growth is positively associated with the efficiency of banking industry. Martinez Peria et al (2004) also find increased foreign bank entry is associated with cost reduction throughout the banking system.

It is not clear yet whether foreign bank penetration has a positive or negative effect on firms' access to credit. A common argument against foreign bank entry is that foreign banks would tend to "cherry pick" the most profitable borrowers, leaving some firms unattended, especially the small and medium sized firms who are likely informationally opaque. If this argument is justified, a high level of foreign bank

[66] Capital and labor are excluded in their regression model since the cost of capital (then the capital accumulation) is assumed to be affected by financial development and labor is assumed playing no special role. However, economies with comparably equivalent financial development are still observed with substantial difference in capital cost. The cost of capital could be more affected by monetary policy rather than the development of financial sector. In our paper, I include some measures of the development in financial market, and capital accumulation and labor are still fundamental production factors that affect economic growth. The pool of both developed and developing countries also only partially helps to answer the question whether and how foreign bank penetration could affect economic growth for emerging and relatively poor economies.

penetration may hurt the economic growth of host countries since small and medium sized firms represents the largest group of the total enterprises and hire a large share of employees.[67] Berger et al (2001) find that foreign banks avoid lending to informationally opaque firms. Clarke et al (2001) find that foreign bank penetration improves financing conditions for enterprises of all sizes, although this process seems to benefit larger firms more. Clarke et al (2002) find that foreign banks in a sample of four Latin American countries generally lend less to small businesses than private domestic banks, but the difference is primarily driven by the behavior of small foreign banks, and large foreign banks lend more to small businesses than large domestic banks in two countries. Detragiache et al (2006) developed a theoretical model and find empirical evidence in 89 poor countries to support that credit to the private sector is lower in countries with more foreign bank participation when foreign banks depend on hard data for loan decisions. Gormley (2007) uses data in India and finds that foreign banks finance only a small set of very profitable firms and on average firms were 8 percentage points less likely to have a loan. Giannetti and Ongena (2007) find although foreign banks lending stimulates growth in firm sales and assets, the effect is weaker for small firms.

3.3 Data

Annual country level data are used in our analysis, covering 35 main emerging economies in three regions: Eastern and Central Europe, Latin America and Asia.[68]

[67] In addition, foreign banks may not accelerate long-run economic growth if they spur excessive borrowing.
[68] The countries include: Albania, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania,

The time interval is from 1996 to 2003. All variables are averaged over the years 1996 - 1999 and 2000-2003. Therefore, every country has two observations, respectively measuring the mean value of the variables of interest over the periods before and after 2000[69]. By this means, the results of our estimation could be interpreted in the sense of long-run relationship between foreign bank penetration and economic growth.

Foreign bank penetration level is calculated by aggregating individual foreign banks' total assets and dividing the sum over the banking sector total assets. This measure reflects the dominance of foreign banks in the host countries banking market. Consistent with the second essay, I only select commercial banks to construct the aggregate level. Foreign bank penetration varies among the sample countries, with on the average the lowest three in India, Thailand and Ecuador (only 0.76%, 5.51% and 5.73% respectively), and the highest three in Albania, Hong Kong and Hungary (90.94%, 89.16% and 76.28%). In general, Eastern and Central Europe is observed with the highest average foreign bank presence level (43.76%), and Asia the lowest (only 19.69%). For robustness test need, I also constructed the penetration level in terms of loans, by aggregating the loans of foreign banks and dividing over the banking sector total loans. Another alternative series to measure foreign bank penetration level is borrowed from Micco et al (2004), which is also calculated based on bank assets but in a more sophisticated way. All three series are significantly correlated. I also constructed the series for state-owned banks dominance in the

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Macedonia, Moldova, Poland, Romania, Slovak Republic, Slovenia, Ukraine, Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, and Thailand.

[69] Due to data limitation, Ecuador has only annual data since 2000.

banking sector, following the same method.

Except foreign bank penetration level, the ratio of domestic credit over GDP is used to proxy the financial structure in the sample countries. This measure reflects the importance of banking sector in terms of the relative size of its credit. Another proxy that could be used is the ratio of credit to private sector over GDP, however, these two proxies are highly correlated. Following Levine and Zervos (1998), I also add stock market turnover rate to measure the development in stock market since it has been found to have independent effects on economic growth. The data of stock market turnover rate is borrowed from the dataset constructed by Beck et al (2000).

In order to examine whether foreign bank penetration could play additional role after the competitiveness of the banking sector has been controlled, I measure the competitiveness by using the weighted average net interest revenue over average assets for all banks, in the sense that the net interest revenue would be lower in a more competitive banking market. A higher value in net interest revenue over average assets indicates a weaker competition across banks. Concentration level is also calculated to measure the competition among banks, since it is expected that competition would be undermined in a more concentrated market. The concentration level is calculated by aggregating the total assets of the largest three banks in the country and dividing it over the banking sector total assets. These two measures are positively correlated but not significant.

Capital and labor are two fundamental resources to affect economic growth in our model. Capital input is measured by the gross fixed capital formation, equivalent

to gross domestic fixed investment, which includes plant, machinery, and equipment purchases; land improvements; and the construction of infrastructure. Growth rate of fixed capital formation is expected positively related to growth rate of output. The series is directly selected from World Development Indicator (WDI) database. Labor input is measured by employed labor force. I first select the data of labor force from WDI and unemployment rate from International Financial Statistics (IFS). The number of employed labor force is calculated from: labor force * (1 - unemployment rate), and based on which the growth rate of employed labor force is calculated. It is not necessary that the growth rate of employed labor is positively correlated with the growth rate of output since there may exist substitution effects between capital and labor.

It is expected that the initial development level could affect the later economic growth, so I use normalized GDP per capita in 1995 (in terms of dollars of constant value) to control its effects. A country on a lower initial development stage may grow faster than the countries on a higher level, reflecting a convergence of economic growth across countries. Inflation and depreciation rate are included by following the empirical growth literature as being correlated with the growth across countries (Beck et al (2000)). Since I have very short interval of observations, I omit a specific variable to control the advance in technology by assuming it would not change substantially.

<Table 3.1>

The descriptive statistics are reported in Table 3.1. Some characteristics of

emerging economies are revealed from these statistics, for example, emerging economies are characterized with relatively large variation in their growth (the standard deviation is above 3.33% and larger than the mean 2.50%), high but variant capital growth rate (mean 4.30% and standard deviation 10.17%)[70], and slower growth rate in employed labor force (0.98%) which might be due to the relatively high unemployment rate in emerging economies. Inflation and depreciation rate are high in sample countries (both approximately 10%). In banking sector, foreign participation is high on the average (around 37% in both terms of total assets and loans), and state-owned banks remain a relatively high share (21.71%). This reflects the process of financial liberalization process in these economies, by privatizing the state-owned banks and allowing more foreign participants. The dependence on banks for finance varies substantially across countries, ranging from the lowest in Lithuania (13.47%) and the highest in Malaysia (207.35%).

<Table 3.2>

Simple correlation statistics are reported in Table 3.2. The growth rate of fixed capital is positively correlated with the growth rate of real GDP per capita, which may suggest that an important source of growth for emerging economies is accumulated capital stock. The growth rate of employed labor is negatively correlated with output growth rate although the correlation is not significant. This is not surprising if the growth of emerging economies depends more on the growth of capital, which substitutes labor in production. Foreign bank penetration level is positively but

[70] Albania is observed with the highest average growth rate of fixed capital, while Colombia is observed with the largest growth reduction in fixed capital.

weakly correlated with output growth, consistent with the difficulties in the literature to find direct association between foreign bank penetration and economic growth. Although foreign bank penetration level is negatively correlated with net interest revenue over average assets, consistent with the general finding that foreign banks stimulate more intense competition in the banking market, the correlation is not significant.[71]

3.4 Model and Results

In this section I examine whether the effects of capital and labor vary under different foreign bank penetration level. After controlling the competitiveness of the banking sector and other variables, if we still find evidence that the effect of these two production factors on output growth is higher in countries where foreign bank presence is more pronounced, it can be interpreted as the evidence of "direct effect" defined by Demirguc-Kunt et al (1998), that is, foreign banks not only foster a more competitive banking market, but also has additional and relevant effects to have resources better allocated, by using their more advanced expertise and experience to seek and identify good borrowers, or exerting more stringent monitor and corporate control.

Two econometric methods are employed: pooled OLS and fixed-effects estimation. The model of pooled OLS is as follows:

[71] The correlation between alternative foreign bank penetration and competitiveness measures is also negative but insignificant.

$$gr(GDP\ per\ capita)_{i,t} = \beta_0 + \beta_1 \cdot gr(fixed\ capital)_{i,t} + \beta_2 \cdot gr(labor)_{i,t} + \lambda \cdot financial\ structure_{i,t} + \alpha_0 \cdot penetration_{i,t} + \alpha_1 \cdot penetration_{i,t} * gr(fixed\ capital)_{i,t} + \alpha_2 \cdot penetration_{i,t} * gr(labor)_{i,t} + \eta \cdot initial\ development_i + \nu \cdot other\ control\ \text{variables}\ + \varepsilon_{i,t}$$

The model of fixed-effects estimation is:

$$gr(GDP\ per\ capita)_{i,t} = \beta_0 + \beta_1 \cdot gr(fixed\ capital)_{i,t} + \beta_2 \cdot gr(labor)_{i,t} + \lambda \cdot financial\ structure_{i,t} + \alpha_0 \cdot penetration_{i,t} + \alpha_1 \cdot penetration_{i,t} * gr(fixed\ capital)_{i,t} + \alpha_2 \cdot penetration_{i,t} * gr(labor)_{i,t} + \nu \cdot other\ control\ \text{variables}\ + f_i + \varepsilon_{i,t}$$

Different assumptions are applied in above two methods. In pooled OLS, for the purpose of statistic consistency, contemporaneous exogeneity is assumed that the error term $\varepsilon_{i,t}$ is not correlated with the regressors in the same period. I also assume there is no time-constant fixed effect in each country, or this fixed effect is not correlated with regressors. This assumption is relaxed in fixed-effects estimation by allowing fixed country effect f_i and assuming f_i could be correlated with independent variables. In contrast to the assumption of contemporaneous exogeneity in pooled OLS, strict exogeneity is assumed that the error term $\varepsilon_{i,t}$ is not correlated with regressors in all periods. This might be a strong assumption since the feedback from GDP growth rate in period *t* might affect the regressors in the period *t+1*. However, the lagged value of the growth rate of GDP per capita is only weakly and insignificantly correlated with regressors in next period, which is interpreted as evidence against any important feedback.

In both models, the dependent variable is the growth rate of real GDP per capita. Capital and labor are included in the model as the fundamental production factors that affect economic growth. The input of capital is represented by $gr(fixed\ capital)_{i,t}$, the

growth rate of gross fixed capital formation. Labor input is represented by $gr(labor)_{i,t}$, the growth rate of employed labor force. Financial structure variables are included to follow the finance-growth nexus literature to examine whether financial sector is relevant for economic growth. $domcredit_{i,t}$ is the total banking sector credit divided by GDP and represents the size of banking in financial structure. $stturnover_{i,t}$ is the stock market turnover rate, measuring the development in alternative financial markets. $niraaall_{i,t}$ is the weighted average net interest revenue over average assets for all banks, which measures the competitiveness of the banking sector. $sbsta_{i,t}$ measures the relevance of state-owned banks in terms of total assets. In pooled OLS, the variable to control initial development level, $inidevelopment_i$, is included, which is a constant value of normalized real GDP per capita in 1995 across countries.

The variable, $peneta_{i,t}$ is used again as the measure of foreign bank penetration level in terms of total assets. I interact penetration level with production inputs, $gr(fixed\ capital)_{i,t}$ and $gr(labor)_{i,t}$. Positive coefficients before $peneta_{i,t}$*$gr(fixed\ capital)_{i,t}$ and $peneta_{i,t}$*$gr(labor)_{i,t}$ would suggest that in an economy characterized with higher foreign bank penetration level, capital and labor are better allocated in more productive sectors and have higher contribution for economic growth.

<Table 3.3>

The benchmark results are reported in Table 3.3. The coefficient before $gr(fixed\ capital)_{i,t}$ is positive and significant, implying a higher growth rate of fixed capital accumulation is associated with higher growth rate. The coefficient before $gr(labor)_{i,t}$ is negative, suggesting the economic growth in observed countries are associated with

a reduction in employed labor force. This is consistent with the substitution between capital and labor. The initial development, $inidevelopment_i$, is negative and statistically significant, which can be interpreted as an evidence of convergence across countries. Inflation and depreciation both show expected negative sign, although only depreciation is significant in pooled OLS.[72]

The financial sector variables only provide limited evidence for a significant relationship between finance and economic growth. The economic growth rate is not significantly affected by $domcredit_{i,t}$, the size of banking in financial structure. Stock market turnover rate shows significantly positive in only fixed-effects estimation, consistent with Levine and Zervos (1998) in that an active stock market is positively associated with economic growth.

The competitiveness in banking sector suggests significant association with economic growth. The coefficient on $niraaall_{i,t}$ keeps negative and significant in almost all specifications, which implies that higher competitiveness in banking sector is associated with higher economic growth. Since the interactions of $niraaall_{i,t}$ with resource allocation have been included in the model, the coefficient on $niraaall_{i,t}$ could be interpreted as additional effects of competition on economic growth, for example, a competitive banking sector could lower the cost of external financing for firms and foster higher output growth. This result is consistent with Claessens and Laeven (2005).

Now I focus on the results related to foreign bank penetration level, competition

[72] Since inflation and depreciation rate are highly correlated, we have tried to drop either one of them. The results are not changed qualitatively, and the estimated coefficients are only little changed.

and resource allocation. In specification (1) and (2), the coefficient before $niraaall_{i,t}$*$gr(fixed\ capital)_{i,t}$ is negative and significant, meaning that the contribution of capital growth would be higher in a more competitive banking sector relative to a less competitive one. However, the interaction term $niraaall_{i,t}$*$gr(labor)_{i,t}$ is either insignificant or positive in the estimations. The positive sign before this term might be interpreted as the substitution between capital and labor would be higher in a more competitive environment (relative to a less competitive one)[73]. After the effects of competition on resource allocation have been controlled, interaction term before $peneta_{i,t}$*$gr(fixed\ capital)_{i,t}$ is still positive and significant, suggesting the effect of fixed capital growth on output growth is higher in economies with more pronounced foreign bank penetration. Since banks could channel capital to more productive firms through their lending behavior, this can be read as evidence that higher foreign bank penetration would induce more productive allocation of capital. However, the coefficient before $peneta_{i,t}$*$gr(labor)_{i,t}$ is insignificant, implying the effect of labor on GDP growth is not different across countries with different level of foreign bank penetration. These results suggest that foreign banks play an additional role in improving capital allocation besides bringing more competition, consistent with the hypothetical "direct effect" by Demirguc-Kunt et al (1998). The "direct effect" might be derived from foreign banks' better expertise and experience to identify potential good borrowers, or more stringent monitor and corporate control. Since we use averaged yearly data over 4 year, our results could be interpreted in the sense of

[73] One possible reason is that higher competition would have credit more readily channeled to capital-intensive firms and substitute more labor force.

long-run relationship between foreign bank penetration, resource allocation and economic growth.

How could we quantitatively interpret the effect of foreign bank presence on capital allocation? Take specification (1) in Table 3 for example. In an economy with no foreign banks in its banking sector, having other things unchanged, 1% increase in growth rate of fixed capital is associated with an increase in GDP per capita growth rate by around 0.244%. If foreign bank penetration increases by 10%, it tends to increase the GDP per capita additionally by 0.01 %. If the economy is characterized with the average foreign bank presence level (in the sample, 36.92%), the increase in GDP per capita growth would be around 0.281%. It is worthwhile to note that although the effect of foreign bank penetration on resource allocation is statistically significant, it is numerically small, which suggests that the benefits of foreign bank penetration on long-run economic growth should not be overstated.

To test the robustness of the results, I first use alternative measures of foreign bank penetration level, respectively in terms of loans and the data from Micco et al (2004). The results are reported in Table 3.4. The results are qualitatively similar. Even by using the data from Micco et al (2004), the magnitude of the estimate on $peneta_{i,t}$*$gr(fixed\ capital)_{i,t}$ in both estimations are close to the estimate by using initial series. The coefficient is significant in fixed-effects estimation and only narrowly insignificant in pooled OLS.

<Table 3.4>

I also use alternative measures for the competitiveness to conduct robustness test.

The results are reported in Table 3.5, where I replace weighted net interest revenue over average assets for all banks by using weighted net interest revenue over average assets for only domestic banks ($niraadom_{i,t}$), weighted non-interest expenses over average assets for all banks ($nieaaall_{i,t}$), and weighted non-interest expenses over average assets for only domestic banks ($nieaadom_{i,t}$). The coefficient before $peneta_{i,t}$*$gr(fixed\ capital)_{i,t}$ remains qualitatively the same, but only significant when using $nieaaall_{i,t}$ as competition measure. The reason might be that foreign banks entered the host market via merger & acquisition, and reduced substantially the number of domestic banks. The accuracy of measurement for competitiveness by observing only domestic banks is therefore undermined. I also use concentration rate to measure the competition, since a more concentrated banking market would be less competitive. However, all significance of interaction between foreign bank penetration and competition with resource allocation disappear. The reason could be the poor proxy of concentration rate for competition level. The correlation between concentration rate with all other competitiveness measure are tiny (less than 0.1), but relatively large with foreign bank penetration level (more than 0.21).

<Table 3.5>

Finally I test robustness of our estimates by replacing $domcredit_{i,t}$ with $credittoprivate_{i,t}$, the ratio of credit to private sector, which is argued by many research a better measure of banking development (such as Levine and Zervos(1998) and Beck et al (2000)). I also interact this measure with $gr(fixed\ capital)_{i,t}$ and $gr(labor)_{i,t}$ to control the possibility that the observed effects are actually attributable

to the advances in banking development. The results are reported in Table 3.6. The coefficient before $peneta_{i,t}$*$gr(fixed\ capital)_{i,t}$ remains numerically similar and statistically significant in fixed-effects estimation, and only slightly insignificant in pooled OLS. The effects of competitiveness remain, while no significant difference is found in economies with different level of $credittoprivate_{i,t}$.

<Table 3.6>

Although we find some evidence that the effects of capital growth on output growth is higher in economies with higher foreign bank participation, these evidence need to be interpreted very cautiously. We only conclude that the evidence is consistent with the view that higher foreign bank penetration stimulates economic growth by having capital better allocated. A shortcoming in our estimation is the short time-series dimension. After being averaged over 1996-1999 and 2000-2003, each country has only 2 observations, which limited our choice for econometric methods. The strict exogeneity assumption of fixed-effects estimation might be violated if the feedback from GDP growth to regressors is relevant. GMM might overcome the drawbacks in fixed-effects estimation, but it can not be conducted with so few observations.

3.5 Conclusion

This paper addresses the relationship between foreign bank penetration and economic growth by arguing that foreign banks could affect economic growth through more efficient resource allocation. After controlling the competitiveness in the

banking sector, through which resources could be also allocated to the most productive sectors, I find evidence that foreign banks play an additional role to better distribute capital. The evidence is consistent with the hypothetical “direct effect” of foreign banks by energetically seeking and identifying good borrowers, and imposing more stringent monitor and corporate control. Although the effect of foreign bank penetration on better resource allocation is statistically significant, it is numerically small, which suggests that the benefits of foreign bank participation in host banking sector should not be overstated.

However, this paper only adds only a modest contribution to the limited research on foreign bank presence and economic growth. Further research on this issue is required by using alternative econometric methods or expanded cross-sectional and time-series dimensions.

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Appendix of Tables

Table 1. 1 Foreign Ownership of Banks

Shares of Assets of Foreign Banks to Total Assets of Banking Sector								
East & Central Europe								
	1996	1997	1998	1999	2000	2001	2002	2003
Bulgaria	0.01	0.05	0.18	0.31	0.83	0.82	0.85	0.79
Croatia	0.01	0.03	0.10	0.29	0.53	0.57	0.90	0.91
Czech Republic	0.76	0.76	0.76	0.73	0.89	0.89	0.87	0.87
Hungary	0.54	0.70	0.69	0.73	0.74	0.72	0.99	1.00
Poland	0.15	0.19	0.46	0.74	0.97	0.98	0.97	0.98
Romania			0.41	0.31	0.41	0.43	0.53	0.89
Russia	0.05	0.09	0.05	0.08	0.11	0.11	0.12	0.12
Slovak Republic	0.12	0.20	0.27	0.22	0.35	0.89	0.96	0.97
Slovenia	0.07	0.07	0.05	0.04	0.04	0.16	0.18	0.32
Ukraine		0.06	0.07	0.08	0.09	0.10	0.14	0.11
Latin America								
Argentina		0.35	0.49	0.51	0.55	0.58	0.47	0.38
Brazil		0.17	0.22	0.26	0.36	0.37	0.34	0.31
Chile		0.22	0.24	0.29	0.30	0.29	0.42	0.37
Colombia		0.23	0.18	0.16	0.15	0.15	0.12	0.11
Ecuador					0.07	0.07	0.05	0.04
Mexico	0.10	0.16	0.18	0.18	0.20	0.70	0.75	0.69
Peru		0.38	0.42	0.62	0.60	0.68	0.63	0.60
Uruguay		0.32	0.33	0.36	0.50	0.58	0.87	
Venezuela		0.45	0.43	0.41	0.48	0.45	0.39	0.40
Asia								
China	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hong Kong SAR		0.89	0.89	0.89	0.89	0.89	0.90	0.91
India	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Indonesia	0.08	0.09	0.18	0.08	0.08	0.07	0.18	0.29
Korea		0.01	0.01	0.06	0.05	0.04	0.05	0.30
Macau SAR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Malaysia	0.24	0.26	0.27	0.24	0.29	0.37	0.38	0.39
Pakistan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Philippines	0.06	0.08	0.10	0.16	0.09	0.04	0.05	0.05
Singapore		0.06	0.04	0.03	0.10	0.19	0.05	0.04
Thailand		0.02	0.05	0.07	0.06	0.06	0.06	0.06

Notes: Foreign bank is defined as the domestically-based bank with 50% or more assets owned by foreign individual(s) or foreign firm(s) or international institution(s).

Source: Author's calculation based on the data available in BvDEP BankScope CD-ROM

Table 1. 2 Claims on BIS Reporting Banks

	International Claims[1]					Local Claims[2]				
	1998	2000	2002	2004	2005	1998	2000	2002	2004	2005
Eastern & Central Europe										
Bulgaria	1.3	1.4	2.1	5.6	9.2	0.4	0.1	0.8	2.6	3.3
Croatia	3.8	7.3	11.7	19.3	28.1	0.002	0.9	6.6	10.8	18.2
Czech Republic	12.2	11.4	14.1	19.9	29	5.8	15.4	28.2	55.8	65.4
Hungary	16.1	16.9	23.5	47.5	56.6	5.1	7.9	12.8	22.4	26.1
Poland	14.4	22.2	32.7	45.4	64.5	7.8	27.8	44.5	63	60.5
Romania	3.1	3.1	4.8	13.2	22.2	0.3	0.6	1.4	3.9	9.7
Russia	58.6	39.6	37.5	61.5	96.9	0.4	0.9	2	5.6	7.8
Slovak Republic	4.8	3.8	5.2	10	13.7	0.7	1.6	8.4	14.3	26.4
Slovenia	2.5	3.7	5.6	9.5	15.4		0.02	1.2	2.1	2.5
Ukraine	1.3	0.8	1.1	3.9	9.4	0.052	0.06	0.3	0.3	3.2
Latin America										
Argentina	61.5	68.8	28.1	18.7	15.4	21.4	23.3	11.5	12.5	12.2
Bolivia	2	1.3	1.4		0.5	0.4	0.5	0.2		0.2
Brazil	73.3	67.7	53.2	53.6	60.2	62.5	72.1	50.2	66.4	100.3
Chile	22.2	22.3	20.8	20.5	21.3	17.2	27.6	22.3	31.1	36.3
Colombia	17.1	11.6	9.3	8	8.4	5	5.4	4.4	6.6	8.6
Ecuador	3.7	1.6	1.4	1.8	2.1	0.2	0.06	0.1	0.2	0.2
Mexico	65	63.7	65.7	64.6	69.1	20.5	80.4	149.8	166.4	195.1
Peru	10.6	13.2	10.5	10	11	1.4	3.1	2.6	3.5	3.7
Uruguay	5.5	4.9	3.2	3	3.2	1.6	1.7	0.9	0.9	1.1
Venezuela	12.6	13.2	13.1	10.7	12.6	5.5	10	5.3	9.4	11.5
Asia										
China	58.2	58.3	43.7	80.6	94.5	1.2	3.4	5.7	10.6	20.1
Hong Kong SAR	131.4	110	81.9	108.3	118.2	138.4	165.2	166	191.6	192.2
India	19.3	22.2	17.6	42.6	55.7	10.6	16.8	21.4	29.4	37.2
Indonesia	44.8	40.2	28.2	30.7	33.1	2.9	4.5	5.3	7.1	11.4
Korea	65.3	58.8	60.9	81.4	89.9	10.7	18.1	25.8	79.5	131.3
Macau SAR	1.1	1.3	1.5	1.8	2.9	0.1	0.9	0.2	0.3	0.9
Malaysia	20.8	20.8	20.3	33.2	34.1	6.6	29	31	40.5	44.5
Pakistan	5	4.1	2.3	2	1.9	2.3	3	3.5	3.8	3.8
Philippines	16.2	16.5	16	19.8	20.9	3.5	5.3	4.9	4.7	5.7
Singapore	125.1	100.1	85.5	103.1	108.3	26.5	32.4	44.3	54.5	57.5
Taiwan, China	21	18.1	17.9	43.9	42.6	12.8	16.2	23.3	34.9	35.9
Thailand	40.7	26.7	17.5	19.5	21.3	10.4	16.6	17.9	21.4	22.1

Notes: [1]: BIS reporting banks' cross-border claims in all currencies and local claims in foreign currencies. [2]: BIS reporting banks' local claims in local currencies

Source: BIS

Table 1. 3 Ratio of Local to International Claims and Domestic Bank Credit

	Local claims[1]/International Claims[2]					Local claims/Domestic Bank Credit[3]				
	1998	2000	2002	2004	2005	1998	2000	2002	2004	2005
	in percentages									
East & Central Europe										
Bulgaria	31	7	38	46	35	19	4	20	27	30
Croatia		12	56	55	64	0	10	42	43	67
Czech Republic	48	135	200	280	225	14	53	81	99	
Hungary	32	46	54	47	46	17	31	31	33	40
Poland	54	125	136	138	93	14	47	61	61	61
Romania	10	19	29	29	43	4	13	23	31	55
Russia	1	2	5	9	8	0.7	1	2	3	5
Slovak Republic	15	42	161	143	192	5	14	59	69	
Slovenia		0.5	21	22	16		0.2	10	10	11
Ukraine	4	7	27	7	34	0.7	0.8	2	1	11
Latin America										
Argentina	35	33	40	66	79	22	24	19	18	18
Bolivia	20	38	14		40	8	11	5		5
Brazil	85	106	94	123	166	12	17	16	12	13
Chile	77	123	107	151	170	33	53	46	43	43
Colombia	29	46	47	82	102	17	23	19	19	20
Ecuador	5	3	7	11	9	20	30	50	100	66
Mexico	31	126	228	257	282	13	45	81	88	93
Peru	13	23	24	35	33	11	22	19	28	28
Uruguay	29	34	28	30	34	15	16	10	11	15
Venezuela	43	75	40	87	91	37	66	46	83	66
Asia										
China	2	5	13	13	21	0.1	0.2	0.2	0.4	
Hong Kong SAR	105	150	202	176	162	56	71	71	78	75
India	55	75	121	69	66	5	7	7	6	7
Indonesia	6	11	18	23	34	4	5	5	5	8
Korea	16	30	42	97	146	3	4	4	11	16
Macau SAR	7	69	13	16	31	2.2	34	12	75	
Malaysia	31	139	152	121	130	7	29	28	29	28
Pakistan	46	73	152	190	200	7	10	12	9	7
Philippines	21	32	30	23	27	7	12	11	10	12
Singapore	21	32	51	52	53	36	44	63	64	73
Taiwan, China	60	89	130	79	84					
Thailand	25	62	102	109	103	6	13	14	13	14

Notes: [1]: BIS reporting banks' local claims in local currencies. [2]: Reporting banks' cross-border claims in all currencies and local claims in foreign currencies. [3]: IFS domestic credit adjusted for the end-period exchange rate. Domestic credit is the credit provided by banks in the local markets.

Source: BIS, IFS, and author's calculation.

Table 1. 4 Simulation Parameters

Benchmark Parameter		
p	0.2	
λ	3.65	
α	0.75	
ϕ	0.65	
σ	0.4	
ρ	1.85	
ε	0.01	
i^*	0.04	
δ	0.08	
	Domestic Bank Dominance Scenario	Foreign Bank Dominance Scenario
A	0.025	0.025
B	0.05	0.05
C	0.07	0.03
D	0.15	0.06

Table 2. 1 Number of Domestic and Foreign Banks in Dataset

Country		1996	1997	1998	1999	2000	2001	2002	2003
East & Central Europe									
Albania	D	0	0	1	1	0	0	0	0
	F	0	1	0	4	5	5	5	5
Belarus	D	5	5	4	8	7	9	7	6
	F	0	1	0	2	3	4	6	5
Bulgaria	D	7	11	11	7	8	5	7	8
	F	1	4	6	10	13	13	14	13
Croatia	D	31	37	29	24	20	19	16	14
	F	1	3	4	7	14	15	16	14
Czech	D	10	10	9	8	7	5	5	6
	F	9	10	10	13	15	15	15	14
Estonia	D	8	9	3	2	2	2	3	3
	F	0	0	1	2	3	3	3	2
Hungary	D	4	2	2	2	2	2	1	0
	F	17	22	19	22	22	18	18	17
Latvia	D	16	19	15	17	15	15	14	14
	F	0	3	3	4	4	4	5	6
Lithuania	D	7	9	10	9	6	5	4	4
	F	0	0	0	0	2	4	5	5
Macedonia	D	7	7	7	8	7	7	7	7
	F	1	1	1	2	3	4	4	4
Moldova	D	5	6	5	8	9	9	9	7
	F	1	1	1	1	1	2	2	2
Poland	D	24	25	16	12	8	4	4	4
	F	11	12	19	22	29	29	28	27
Romania	D	2	5	10	11	10	10	8	4
	F	2	2	8	9	11	12	13	14
Slovak	D	11	11	9	8	6	4	2	1
	F	7	7	7	6	8	8	11	10
Slovenia	D	21	21	16	16	15	11	8	7
	F	3	3	2	2	2	3	4	4
Ukraine	D	9	16	18	24	26	26	23	17
	F	1	3	3	4	5	7	7	7
Latin America									
Argentina	D	44	53	51	45	38	38	38	32
	F	16	22	28	29	29	29	21	19
Bolivia	D	2	9	6	6	6	6	6	6
	F	1	5	5	5	5	5	5	5
Brazil	D	63	77	69	62	57	64	60	46
	F	33	36	46	49	48	46	43	29
Chile	D	1	13	13	12	12	12	11	11
	F	8	16	15	14	13	12	11	11

Colombia	D	8	20	17	15	17	17	19	19
	F	5	10	9	8	8	7	7	7
Ecuador	D	0	3	3	2	18	18	19	19
	F	0	2	2	2	4	3	3	3
Mexico	D	17	17	17	18	16	15	13	12
	F	16	13	17	16	16	13	16	12
Paraguay	D	2	5	9	8	8	6	6	5
	F	3	8	14	14	14	13	11	9
Peru	D	8	13	12	7	8	5	5	5
	F	3	10	11	10	10	10	10	9
Uruguay	D	3	6	7	6	7	6	1	2
	F	7	10	12	12	26	25	23	21
Venezuela	D	5	17	17	31	24	24	23	21
	F	1	6	6	12	13	9	8	6
Asia									
Hong Kong	D	9	10	11	12	10	7	8	7
	F	20	25	25	24	26	26	26	24
India	D	57	59	60	61	59	55	54	49
	F	1	3	3	3	3	2	1	1
Indonesia	D	36	36	25	34	31	30	31	24
	F	19	17	15	20	20	19	17	16
Korea	D	18	28	18	17	15	15	15	12
	F	1	1	1	2	1	2	2	4
Malaysia	D	20	20	20	17	12	11	10	9
	F	10	10	11	11	12	14	14	13
Singapore	D	9	12	9	9	9	6	4	4
	F	4	4	6	5	8	7	7	6
Philippines	D	17	20	20	17	16	20	25	26
	F	5	6	6	9	7	5	7	6
Thailand	D	6	11	10	8	8	9	10	10
	F	0	1	2	4	4	4	4	4
OVERALL	D	492	622	559	552	519	497	476	421
	F	207	278	318	359	407	397	392	354
	T	699	900	877	911	926	894	868	775

Notes: Only commercial banks are covered in our dataset. The numbers of banks are summarized after the removal of outliers. “D” represents domestic banks, and “F” foreign banks. “T” means “total”.

Table 2. 2 Monetary Policy Indicators

Country	Indicator of Monetary Policy	Country	Indicator of Monetary Policy
Albania	Treasury Bill Rate	Latvia	Treasury Bill Rate
Argentina	Money Market Rate	Lithuania	Treasury Bill Rate
Australia	Money Market Rate	Luxemburg	Money Market Rate
Austria	Money Market Rate	Macedonia	Discount Rate
Belarus	Discount Rate	Macau	Money Market Rate
Bahrain	Treasury Bill Rate	Malaysia	Treasury Bill Rate
Belgium	Treasury Bill Rate	Maldives	Money Market Rate
Bolivia	Treasury Bill Rate	Mexico	Treasury Bill Rate
Brazil	Treasury Bill Rate	Moldova	Treasury Bill Rate
Bulgaria	Treasury Bill Rate	Netherlands	Money Market Rate
Canada	Treasury Bill Rate	Paraguay	Money Market Rate
Chile	Discount Rate	Peru	Money Market Rate
China	Money Market Rate	Philippines	Treasury Bill Rate
Colombia	Money Market Rate	Poland	Money Market Rate
Croatia	Money Market Rate	Portugal	Money Market Rate
Czech	Treasury Bill Rate	Romania	Treasury Bill Rate
Cyprus	Money Market Rate	Russia	Money Market Rate
Denmark	Money Market Rate	Saudi Arabia	Deposit Rate
Ecuador	Discount Rate	Singapore	Treasury Bill Rate
Estonia	Money Market Rate	Slovak	Money Market Rate
Finland	Money Market Rate	Slovenia	Money Market Rate
France	Treasury Bill Rate	South Africa	Treasury Bill Rate
Germany	Treasury Bill Rate	Spain	Treasury Bill Rate
Greece	Treasury Bill Rate	Sweden	Treasury Bill Rate
Hong Kong	Money Market Rate	Switzerland	Treasury Bill Rate
Hungary	Treasury Bill Rate	Taiwan	Money Market Rate
India	Money Market Rate	Thailand	Money Market Rate
Indonesia	Money Market Rate	Turkey	Money Market Rate
Ireland	Money Market Rate	UK	Treasury Bill Rate
Israel	Treasury Bill Rate	Ukraine	Money Market Rate
Italy	Treasury Bill Rate	Uruguay	Money Market Rate
Japan	Money Market Rate	US	Treasury Bill Rate
Korea	Money Market Rate	Venezuela	Money Market Rate
Kuwait	Money Market Rate		

Notes: (1) India's money market rate, to be exact, the weighted average call money market rate, is extracted from its central bank's website. (3) Slovakia's money market rate is author's own calculation based on the average 3 month Bratislava Interbank Offered Rates. (4) Taiwan's money market rate is from its central bank website, since it is not available from IFS. (5) Saudi Arabia's monetary indicator is deposit rate, since it is the only rate available from IFS. Source: IFS and some central banks' websites.

Table 2. 3 Descriptive statistics: domestic vs. foreign banks

	Domestic Banks						Foreign Banks					
	obs	Mean	Std.dev.	Median	Min	Max	obs	Mean	Std.dev.	Median	Min	Max
						OVERALL						
Loans/Total Assets	4138	47.24	19.07	48.32	0	97.77	2712	48.52	22.15	48.76	0	99.98
Liquid Assets/ Total Assets	4137	35.22	20.04	32.85	0.16	99.76	2710	37.27	20.81	35.39	0	100
Total Earning Assets/ Total Assets	4138	85.38	10.61	88.34	9.72	100	2712	86.48	12.18	90.18	0.20	100
Total Non Earning Assets/ Total Assets	4136	10.27	8.68	7.81	0	74.00	2712	10.69	11.30	6.87	0	98.69
Deposit/Total Assets	4138	69.71	20.23	75.93	0	98.51	2712	65.22	24.64	74.21	0	98.87
Equity/Total Assets	4138	14.45	12.73	10.74	0	99.52	2703	16.72	15.38	11.74	1.00	99.68
Non Interest Expenses/Average Assets	4078	8.28	14.77	5.72	0.15	666.02	2678	6.63	7.37	4.86	0	123.53
Interest Rate of Loans	4092	16.41	17.73	11.74	0.18	434.97	2697	18.60	31.73	10.73	0	500
Interest Rate of Deposits	4072	11.50	17.99	7.54	0	447.65	2685	16.40	35.26	7.03	0	461.31
Interest Rate Spread	4072	4.94	14.83	3.59	-327.53	229.25	2685	2.22	20.86	3.00	-368.13	260
Growth Rate of Total Assets	3260	11.55	29.78	8.23	-94.61	193.13	2274	10.90	35.20	7.10	-92.25	195.51
Growth Rate of Loans	3248	13.46	42.88	8.39	-100	294.93	2266	13.06	49.27	6.63	-100	298.85
Growth Rate of Deposits	3252	13.29	36.65	8.45	-100	235.85	2267	12.76	48.16	6.81	-100	295.97
Growth Rate of Loan Interest Rate	3220	6.16	90.20	-5.14	-97.90	2585.74	2259	9.96	74.14	-6.13	-97.98	1148.99
Growth Rate of Deposit Interest Rate	3198	20.60	357.18	-5.67	-100	14816.1	2242	21.51	164.40	-8.83	-100	5590.63
Net Interest Margin	4095	7.10	8.34	4.8	-72.31	104.21	2697	5.97	6.38	4.43	-34.54	127.34
Return on Average Assets	4115	1.06	4.49	1.04	-70.3	62.24	2704	0.75	5.33	1	-111.13	68.6

Table 2.3 (Continued)

	Domestic Banks						Foreign Banks					
	obs	Mean	Std.dev.	Median	Min	Max	obs	Mean	Std.dev.	Median	Min	Max
	East & Central Europe											
Loans/Total Assets	1191	43.86	17.41	45.13	0	84.21	912	45.43	18.37	44.82	0	98.01
Liquid Assets/ Total Assets	1191	40.00	18.46	37.56	4.66	96.39	912	43.60	18.48	42.33	0.34	99.11
Total Earning Assets/ Total Assets	1191	83.62	10.56	86.56	26.04	98.43	912	90.01	6.86	91.70	29.41	99.66
Total Non Earning Assets/ Total Assets	1189	9.34	7.67	7.20	0	54.65	912	6.55	4.95	5.20	0	35.13
Deposit/Total Assets	1191	72.19	16.65	76.07	2.35	98.51	912	76.12	14.74	80.22	0	96.08
Equity/Total Assets	1191	17.65	13.42	13.78	0	95.24	912	14.31	11.61	10.62	1.16	98.12
Non Interest Expenses/Average Assets	1157	9.67	23.42	7.21	0.15	666.02	903	5.95	6.78	4.64	0.07	123.53
Interest Rate of Loans	1166	13.46	9.30	11.02	1.06	98.22	908	10.78	17.27	8.30	0.77	500
Interest Rate of Deposits	1163	7.94	7.94	5.87	0	127.55	905	7.90	16.76	5.16	0.52	318.15
Interest Rate Spread	1163	5.55	7.48	4.72	-121.53	65.35	905	2.88	16.54	3.14	-307.95	260
Growth Rate of Total Assets	910	17.04	33.72	12.12	-94.61	188.62	782	19.69	34.17	13.20	-86.35	195.51
Growth Rate of Loans	907	26.11	52.92	17.02	-100	294.93	780	28.55	48.82	20.64	-100	298.85
Growth Rate of Deposits	910	21.10	45.84	13.23	-94.74	235.85	781	22.70	44.80	14.05	-100	295.97
Growth Rate of Loan Interest Rate	890	1.36	84.76	-10.13	-86.39	1942.11	777	-3.37	37.23	-8.95	-78.85	550.73
Growth Rate of Deposit Interest Rate	883	26.36	518.27	-10.03	-93.30	14816.1	773	-0.32	71.45	-12.42	-86.59	1399.15
Net Interest Margin	1169	7.22	6.01	5.76	-19.35	73.01	908	4.96	3.44	4.09	-5.26	28.54
Return on Average Assets	1178	1.34	4.10	1.21	-33.59	35.1	908	1.07	3.64	1.1	-35.19	65.62

Table 2.3 (Continued)

	Domestic Banks						Foreign Banks					
	obs	Mean	Std.dev.	Median	Min	Max	obs	Mean	Std.dev.	Median	Min	Max
						Latin America						
Loans/Total Assets	1620	47.31	21.29	50.11	0	95.65	1214	47.59	24.07	48.27	0	99.69
Liquid Assets/ Total Assets	1619	31.40	20.94	26.57	0.34	99.76	1214	34.76	21.73	31.12	0.16	100
Total Earning Assets/ Total Assets	1620	82.86	11.09	85.31	25.17	100	1214	81.35	14.53	84.91	8.24	100
Total Non Earning Assets/ Total Assets	1620	13.23	9.86	10.62	0	74.00	1214	15.62	13.70	11.85	0	88.67
Deposit/Total Assets	1620	62.11	23.41	68.75	0	97.10	1214	55.70	28.21	64.33	0	96.68
Equity/Total Assets	1620	16.18	13.72	11.94	0.09	99.52	1214	19.01	18.20	12.45	1.43	99.68
Non Interest Expenses/Average Assets	1610	10.97	11.25	8.59	0.16	201.92	1209	8.53	8.45	6.42	0	93.51
Interest Rate of Loans	1612	23.33	24.41	18.80	0.18	434.97	1211	29.13	42.38	17.50	0.23	448.29
Interest Rate of Deposits	1605	16.61	26.13	11.05	0	447.65	1202	26.65	47.99	12.52	0	461.31
Interest Rate Spread	1605	6.76	21.57	5.79	-327.53	229.25	1202	2.60	26.35	3.94	-368.13	172.97
Growth Rate of Total Assets	1270	7.79	31.14	5.44	-90.46	193.13	1004	6.15	36.82	3.56	-92.25	195.49
Growth Rate of Loans	1262	5.90	41.72	2.15	-100	273.68	998	4.09	49.92	-1.14	-100	292.83
Growth Rate of Deposits	1263	8.18	35.87	5.27	-100	221.14	998	6.18	51.71	2.13	-100	252.22
Growth Rate of Loan Interest Rate	1262	14.26	96.34	-1.84	-97.90	2136.47	1000	26.37	100.28	2.00	-97.40	1148.99
Growth Rate of Deposit Interest Rate	1254	32.07	354.18	-3.70	-100	11716.4	987	50.64	231.52	2.56	-100	5590.63
Net Interest Margin	1612	10.23	10.42	7.33	-14.43	104.21	1211	7.70	7.74	5.79	-34.54	80.48
Return on Average Assets	1612	1.30	5.80	1.21	-70.3	62.24	1212	0.27	6.51	0.8	-111.13	39.76

Table 2.3 (Continued)

	Domestic Banks						Foreign Banks					
	obs	Mean	Std.dev.	Median	Min	Max	obs	Mean	Std.dev.	Median	Min	Max
						Asia						
Loans/Total Assets	1327	50.17	17.05	49.26	0	97.77	586	55.23	22.00	56.95	0	99.98
Liquid Assets/ Total Assets	1327	35.59	19.32	36.21	0.16	99.27	584	32.60	19.95	28.75	0	96.30
Total Earning Assets/ Total Assets	1327	90.03	8.28	91.88	9.72	99.93	586	91.61	8.71	94.19	0.20	99.98
Total Non Earning Assets/ Total Assets	1327	7.48	6.64	5.87	0.03	70.95	586	6.92	8.54	4.29	0.02	98.69
Deposit/Total Assets	1327	76.76	15.24	80.93	0	94.86	586	67.99	21.09	74.22	0	98.87
Equity/Total Assets	1327	9.48	8.75	6.64	0.09	98.85	577	15.69	13.32	12.27	1.00	97.34
Non Interest Expenses/Average Assets	1311	3.75	2.78	3.27	0.15	38.29	566	3.66	3.76	2.42	0.02	35.26
Interest Rate of Loans	1314	10.54	8.40	9.55	0.18	205.58	578	8.84	6.72	7.99	0	128.33
Interest Rate of Deposits	1304	8.40	7.87	7.02	0.11	152.25	578	8.42	12.37	5.77	0	140.32
Interest Rate Spread	1304	2.17	7.26	2.39	-141.04	158.98	578	0.42	12.11	2.01	-129.69	123.62
Growth Rate of Total Assets	1080	11.36	23.20	8.24	-85.59	189.94	488	6.59	30.52	2.66	-64.44	152.39
Growth Rate of Loans	1079	11.67	30.74	9.16	-99.52	283.26	488	6.63	42.28	0.97	-100	226.58
Growth Rate of Deposits	1079	12.68	26.29	8.50	-97.46	220.66	488	10.32	43.01	3.85	-100	281.48
Growth Rate of Loan Interest Rate	1068	0.60	86.37	-4.48	-90.17	2585.74	482	-2.57	41.02	-10.89	-97.98	276.80
Growth Rate of Deposit Interest Rate	1061	2.23	111.64	-5.36	-98.64	2823.92	482	-3.11	68.88	-15.89	-96.37	802.67
Net Interest Margin	1314	3.15	4.90	3.15	-72.31	51.04	578	3.95	5.84	3.16	-2.6	127.34
Return on Average Assets	1325	0.50	2.48	0.82	-34.17	13.69	584	1.27	4.72	1.25	-23.02	68.6

Table 2.3 (Continued)

	Private Domestic Banks						Government-owned Domestic Banks					
	obs	Mean	Std.dev.	Median	Min	Max	obs	Mean	Std.dev.	Median	Min	Max
						OVERALL						
Loans/Total Assets	3237	48.06	19.35	50.35	0	97.72	901	44.26	17.74	43.43	0	97.77
Liquid Assets/ Total Assets	3237	34.07	20.00	30.96	0.16	99.76	900	39.37	19.62	42.50	0.68	95.64
Total Earning Assets/ Total Assets	3237	84.56	11.06	87.56	9.72	100	901	88.31	8.16	90.53	31.45	99.37
Total Non Earning Assets/ Total Assets	3235	10.79	9.04	8.26	0	74.00	901	8.39	6.92	6.34	0.14	67.03
Deposit/Total Assets	3237	68.44	20.39	74.78	0	97.70	901	74.25	18.96	80.04	0	98.51
Equity/Total Assets	3237	15.82	13.06	11.89	0	99.52	901	9.53	10.04	6.35	0.09	97.16
Non Interest Expenses/Average Assets	3203	8.70	15.88	6.17	-7.17	666.02	889	6.59	9.51	4.22	-12.99	219.84
Interest Rate of Loans	3202	17.55	19.38	12.68	0.18	434.97	890	12.32	8.53	9.91	0.18	106.32
Interest Rate of Deposits	3189	11.63	17.71	7.73	0	447.65	883	11.04	18.99	7.23	0.11	333.33
Interest Rate Spread	3189	5.95	13.55	4.13	-327.53	229.25	883	1.32	18.31	2.79	-325.00	35.16
Growth Rate of Total Assets	2535	12.02	30.94	8.42	-90.46	193.13	725	9.94	25.27	7.83	-94.61	159.94
Growth Rate of Loans	2526	13.74	44.50	7.78	-100	294.93	722	12.49	36.68	9.70	-91.91	274.00
Growth Rate of Deposits	2529	14.26	38.04	8.93	-100	235.85	723	9.92	31.12	7.61	-100	220.66
Growth Rate of Loan Interest Rate	2505	6.68	83.92	-5.21	-97.90	2136.47	715	4.35	109.42	-4.84	-82.89	2585.74
Growth Rate of Deposit Interest Rate	2490	18.85	318.20	-5.70	-100	14816.1	708	26.73	469.45	-5.58	-98.64	11716.4
Net Interest Margin	3205	7.78	9.00	5.36	-72.31	104.21	890	4.66	4.60	3.62	-15.82	45.25
Return on Average Assets	3219	1.26	4.43	1.14	-67.76	62.24	896	0.32	4.59	0.75	-70.3	35.1

Table 2. 4 Descriptive Statistics: t-tests

Variable	Domestic ≠ Foreign	Domestic < Foreign	Domestic > Foreign	Domestic σ/μ	Foreign σ/μ
Loans/Total Assets	0.0108	0.0054	0.9946	0.4038	0.4565
Liquid Assets/ Total Assets	0.0000	0.0000	1.0000	0.5690	0.5584
Total Earning Assets/ Total Assets	0.0001	0.0000	1.0000	0.1243	0.1408
Total Non Earning Assets/ Total Assets	0.0818	0.0409	0.9591	0.8452	1.0571
Deposit/Total Assets	0.0000	1.0000	0.0000	0.2901	0.3778
Equity/Total Assets	0.0000	0.0000	1.0000	0.8810	0.9199
Non Interest Expenses/Average Assets	0.0000	1.0000	0.0000	1.7934	1.1279
Interest Rate of Loans	0.0003	0.0001	0.9999	1.0804	1.7059
Interest Rate of Deposits	0.0000	0.0000	1.0000	1.5643	2.1494
Interest Rate Spread	0.0000	1.0000	0.0000	3.0020	9.3964
Growth Rate of Total Assets	0.4571	0.7715	0.2285	2.5784	3.2294
Growth Rate of Loans	0.7495	0.6253	0.3747	3.1763	3.7726
Growth Rate of Deposits	0.6435	0.6782	0.3218	2.7577	3.7743
Growth Rate of Loan Interest Rate	0.0993	0.0496	0.9504	14.6429	7.4438
Growth Rate of Deposit Interest Rate	0.9098	0.4549	0.5451	17.3383	7.6430
Net Interest Margin	0.0000	1.0000	0.0000	1.1746	1.0687
Return on Average Assets	0.0108	0.9946	0.0054	4.2358	7.1067

Notes: Domestic ≠ Foreign: p-value of two-sided t-test on equality of mean. H1: μ(domestic banks) ≠ μ(foreign banks).

Domestic < Foreign: p-value of one-sided t-test on equality of mean. H1: μ(domestic banks) < μ(foreign banks).

Domestic > Foreign: p-value of one-sided t-test on equality of mean. H1: μ(domestic banks) > μ(foreign banks).

Table 2.4 (Continued)

Variable	Private ≠ State	Private<State	Private >State
Loans/Total Assets	0.0000	1.0000	0.0000
Liquid Assets/ Total Assets	0.0000	0.0000	1.0000
Total Earning Assets/ Total Assets	0.0000	0.0000	1.0000
Total Non Earning Assets/ Total Assets	0.0000	1.0000	0.0000
Deposit/Total Assets	0.0000	0.0000	1.0000
Equity/Total Assets	0.0000	1.0000	0.0000
Non Interest Expenses/Average Assets	0.0002	0.9999	0.0001
Interest Rate of Loans	0.0000	1.0000	0.0000
Interest Rate of Deposits	0.3822	0.8089	0.1911
Interest Rate Spread	0.0000	1.0000	0.0000
Growth Rate of Total Assets	0.0979	0.9511	0.0489
Growth Rate of Loans	0.4902	0.7549	0.2451
Growth Rate of Deposits	0.0051	0.9975	0.0025
Growth Rate of Loan Interest Rate	0.5431	0.7285	0.2715
Growth Rate of Deposit Interest Rate	0.6045	0.3023	0.6977
Net Interest Margin	0.0000	1.0000	0.0000
Return on Average Assets	0.0000	1.0000	0.0000

Notes: Private ≠ State: p-value of two-sided t-test on equality of mean. H1: μ(domestic private banks) ≠ μ(domestic state-owned banks).
Private < (>) State: p-value of one-sided t-test on equality of mean. H1: μ(domestic private banks) < (>) μ(domestic state-owned banks).
p-value equal to or smaller than 5% (**), 10% (*).

Table 2. 5 Correlation among Selected Variables

	All Banks										
	Loans/TA	Liquidity/TA	Deposit/TA	Equity/TA	Loan Rate	Deposit Rate	Growth Rate of Loans	Growth Rate of Deposits	Growth Rate of Loan Rate	Growth Rate of Deposit Rate	Monetary Policy
Loans/TA	1.0000										
Liquidity/ TA	-0.7818**	1.0000									
	(0.0000)										
Deposit/TA	0.2654**	-0.1533**	1.0000								
	(0.0000)	(0.0000)									
Equity/TA	-0.1532**	0.0404**	-0.5498**	1.0000							
	(0.0000)	(0.0008)	(0.0000)								
Loan Rate	0.0035	-0.0591**	-0.0953**	0.1185**	1.0000						
	(0.7740)	(0.0000)	(0.0000)	(0.0000)							
Deposit Rate	-0.0157	-0.0070	-0.2587**	0.1663**	0.7638**	1.0000					
	(0.1975)	(0.5671)	(0.0000)	(0.0000)	(0.0000)						
Growth Rate of	0.1528**	-0.0493**	0.0754**	-0.0817**	-0.1407**	-0.1308**	1.0000				
Loans	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)					
Growth Rate of	0.0555**	0.0173	0.1635**	-0.1323**	-0.1144**	-0.1589**	0.5186**	1.0000			
Deposits	(0.0000)	(0.1995)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)				
Growth Rate of	0.0071	-0.0270**	-0.0841**	0.0448**	0.3824**	0.3043**	-0.0611**	-0.0956**	1.0000		
Loan Rate	(0.5995)	(0.0457)	(0.0000)	(0.0009)	(0.0000)	(0.0000)	(0.0000)	(0.0000)			
Growth Rate of	-0.0368**	0.0184	-0.1433**	0.1863**	0.1213**	0.2379**	0.0194	-0.1096**	0.2398**	1.0000	
Deposit Rate	(0.0066)	(0.1750)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.1528)	(0.0000)	(0.0000)		
Monetary	-0.1178**	0.0921**	-0.1744**	0.1271**	0.3979**	0.3438**	-0.1194**	-0.0854**	0.2288**	0.0812**	1.0000
Policy	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	

Table 2.5 (Continued)

	Domestic Banks										
	Loans/TA	Liquidity/TA	Deposit/TA	Equity/TA	Loan Rate	Deposit Rate	Growth Rate of Loans	Growth Rate of Deposits	Growth Rate of Loan Rate	Growth Rate of Deposit Rate	Monetary Policy
Loans/TA	1.0000										
Liquidity/ TA	-0.7640**	1.0000									
	(0.0000)										
Deposit/TA	0.2130**	-0.1071**	1.0000								
	(0.0000)	(0.0000)									
Equity/TA	-0.1237**	-0.0088	-0.5750**	1.0000							
	(0.0000)	(0.5707)	(0.0000)								
Loan Rate	-0.0341**	-0.0598**	-0.1414**	0.1800**	1.0000						
	(0.0294)	(0.0001)	(0.0000)	(0.0000)							
Deposit Rate	-0.0547**	0.0087	-0.3059**	0.2060**	0.6559**	1.0000					
	(0.0005)	(0.5775)	(0.0000)	(0.0000)	(0.0000)						
Growth Rate of	0.1052**	0.0047	0.0551**	-0.0495**	-0.1077**	-0.0903**	1.0000				
Loans	(0.0000)	(0.7899)	(0.0017)	(0.0048)	(0.0000)	(0.0000)					
Growth Rate of	0.0168	0.0468**	0.1448**	-0.0909**	-0.0730**	-0.1323**	0.5030**	1.0000			
Deposits	(0.3369)	(0.0075)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)				
Growth Rate of	0.0077	-0.0314*	-0.0770**	0.0439**	0.1946**	0.1491**	-0.0425**	-0.0869**	1.0000		
Loan Rate	(0.6628)	(0.0753)	(0.0000)	(0.0127)	(0.0000)	(0.0000)	(0.0160)	(0.0000)			
Growth Rate of	-0.0385**	0.0214	-0.1420**	0.2118**	0.0434**	0.1919**	0.0611**	-0.1016**	0.1773**	1.0000	
Deposit Rate	(0.0293)	(0.2271)	(0.0000)	(0.0000)	(0.0141)	(0.0000)	(0.0006)	(0.0000)	(0.0000)		
Monetary	-0.1621**	0.1187**	-0.1883**	0.1707**	0.3500**	0.2708**	-0.1713**	-0.1381**	0.1155**	0.0348**	1.0000
Policy	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0491)	

Table 2.5 (Continued)

	Foreign Banks										
	Loans/TA	Liquidity/TA	Deposit/TA	Equity/TA	Loan Rate	Deposit Rate	Growth Rate of Loans	Growth Rate of Deposits	Growth Rate of Loan Rate	Growth Rate of Deposit Rate	Monetary Policy
Loans/TA	1.0000										
Liquidity/ TA	-0.8132**	1.0000									
	(0.0000)										
Deposit/TA	0.3316**	-0.2014**	1.0000								
	(0.0000)	(0.0000)									
Equity/TA	-0.1915**	0.0921**	-0.5165**	1.0000							
	(0.0000)	(0.0000)	(0.0000)								
Loan Rate	0.0289	-0.0671**	-0.0595**	0.0737**	1.0000						
	(0.1337)	(0.0005)	(0.0020)	(0.0001)							
Deposit Rate	0.0048	-0.0278	-0.2294**	0.1390**	0.8112**	1.0000					
	(0.8050)	(0.1500)	(0.0000)	(0.0000)	(0.0000)						
Growth Rate of	0.2046**	-0.1148**	0.0962**	-0.1148**	-0.1695**	-0.1648**	1.0000				
Loans	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)					
Growth Rate of	0.0926**	-0.0132	0.1809**	-0.1694**	-0.1414**	-0.1792**	0.5354**	1.0000			
Deposits	(0.0000)	(0.5292)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)				
Growth Rate of	0.0044	-0.0230	-0.0934**	0.0440**	0.6214**	0.4947**	-0.0909**	-0.1128**	1.0000		
Loan Rate	(0.8330)	(0.2744)	(0.0000)	(0.0370)	(0.0000)	(0.0000)	(0.0000)	(0.0000)			
Growth Rate of	-0.0443**	0.0137	-0.1974**	0.1780**	0.3311**	0.4771**	-0.0874**	-0.1723**	0.5055**	1.0000	
Deposit Rate	(0.0359)	(0.5171)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		
Monetary	-0.0645**	0.0546**	-0.1582**	0.0747**	0.4591**	0.4241**	-0.0634**	-0.0356	0.4056**	0.2313**	1.0000
Policy	(0.0008)	(0.0046)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0026)	(0.0914)	(0.0000)	(0.0000)	

Notes: p-value in parenthesis. 5% significance (**) 10% significance (*)

Table 2. 6 Effects of Monetary Policy on Growth of Loans and Deposits

Dependent Variable: gr(loans)

(ALL)

	(1)	(2)	(3)	(4)	(5)
gr(loans)_1	.1856***	.1960***	.1608***	.1953***	.1609***
	(.0258)	(.0259)	(.0263)	(.0260)	(.0265)
gr(loans)_2	.0431	.0456*	.0280	.0475*	.0289
	(.0263)	(.0258)	(.0278)	(.0261)	(.0281)
Δmp	-.5748***	-.5185***	-.5465***	-.8266*	-.8790*
	(.1566)	(.1553)	(.1636)	(.4375)	(.4510)
Δmp_1	-.7728***	-.7200***	-.7492***	-.9832**	-1.1785***
	(.1415)	(.1391)	(.1486)	(.3927)	(.4351)
foreign	-2.4449	-3.8481**	-3.3719*	-3.9901**	-3.4723**
	(1.5478)	(1.5849)	(1.7237)	(1.6094)	(1.7219)
state	.9900	-.3621	-.0254	-.7330	-.3398
	(1.5625)	(1.6754)	(1.7238)	(1.7204)	(1.7940)
foreign*Δmp	.5019***	.4544**	.4017**	.4943**	.4208*
	(.1955)	(.1910)	(.1915)	(.2277)	(.2237)
foreign*Δmp_1	.2904	.3109*	.2190	.3228	.2572
	(.1836)	(.1833)	(.1972)	(.2013)	(.2100)
state *Δmp	1.3928***	1.3146***	1.3071***	1.1663***	1.1945***
	(.2554)	(.2522)	(.2438)	(.3154)	(.2900)
state *Δmp_1	.9746***	.9338***	.9977***	.7911***	.8751***
	(.2369)	(.2168)	(.2177)	(.2518)	(.2427)
liquidity_1		.2441***	.2260***	.2484***	.2333***
		(.0488)	(.0654)	(.0519)	(.0676)
capitalization_1		.1117	.0879	.1296	.1010
		(.1079)	(.1192)	(.1230)	(.1338)
bank size_1		.0149	-.1272	.0675	-.0898
		(.0817)	(.1034)	(.0999)	(.1225)
efficiency_1		.0149	-.1190	-.1198	-.1285
		(.0817)	(.1022)	(.0910)	(.1061)
liquidity_1 * Δmp				.0027	.0038
				(.0058)	(.0060)
liquidity_1 * Δmp_1				-.0012	.0028
				(.0044)	(.0048)
capitalization_1 * Δmp				.0083	.0080
				(.0148)	(.0148)
capitalization_1 * Δmp_1				.0099	.0096
				(.0132)	(.0132)
bank size_1 * Δmp				.0213*	.0190
				(.0124)	(.0140)
bank size_1 * Δmp_1				.0198***	.0218***
				(.0067)	(.0070)
efficiency_1*Δmp				.0025	.0008
				(.0042)	(.0043)
efficiency_1*Δmp_1				.0078	.0051
				(.0055)	(.0057)
gr(gdp)	1.1375***	1.0201***	.6928**	.9978***	.6430**
	(.2181)	(.2222)	(.2856)	(.2273)	(.2860)
inflation	-.2501***	-.2311***	-.3084***	-.2282***	-.3092***
	(.0446)	(.0501)	(.0643)	(.0462)	(.0645)
depreciation	.0261	.0143	.0289	.0072	.0235
	(.0349)	(.0335)	(.0362)	(.0298)	(.0320)
constant	5.4502***	-3.1285	24.1907	-3.5421	23.5689
	(1.2661)	(2.4961)	(15.4620)	(2.8533)	(15.6018)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	3024 (905)	3006 (904)	3006 (904)	3006 (904)	3006 (904)
R^2	0.1158	0.1334	0.1647	0.1366	0.1673

Table 2.6 (Continued)

Dependent Variable: gr(loans)

(East & Central Europe)

	(1)	(2)	(3)	(4)	(5)
gr(loans)_1	.2555***	.2584***	.2225***	.2693***	.2334***
	(.0400)	(.0414)	(.0422)	(.0408)	(.0415)
gr(loans)_2	.0182	.0115	.0029	.0123	.0001
	(.0448)	(.0425)	(.0461)	(.0418)	(.0442)
Δmp	-.5272*	-.3393	-.5358	-2.7817**	-2.9779***
	(.3108)	(.3357)	(.4213)	(1.1389)	(1.1245)
Δmp_1	-.2337	-.0512	-.1776	-1.0851	-1.0633
	(.2417)	(.2461)	(.2346)	(.7263)	(.7577)
foreign	2.2345	5.3590*	9.1679**	5.1260*	10.2805***
	(3.1604)	(3.0663)	(3.6670)	(3.0691)	(3.7898)
state	-.4780	1.7847	4.8813	-.6587	2.6911
	(3.1889)	(2.9882)	(3.3242)	(3.4195)	(3.8010)
foreign*Δmp	.1211	.3066	.0819	.3654	.1432
	(.5728)	(.6134)	(.5805)	(.5730)	(.5042)
foreign*Δmp_1	.5560**	.4702	.5349*	.5390*	.6316*
	(.2923)	(.2966)	(.2894)	(.3150)	(.3381)
state *Δmp	1.1522***	1.1005***	.7466*	.2362	-.2914
	(.3762)	(.3443)	(.4474)	(.5553)	(.5773)
state *Δmp_1	.3932	.2348	.2899	.0140	.1157
	(.3016)	(.2957)	(.2542)	(.3299)	(.3107)
liquidity_1		.1957**	.2099**	.2662***	.2669***
		(.0850)	(.0903)	(.0910)	(.0975)
capitalization_1		.3691*	.3923	.5152**	.6677**
		(.2121)	(.2404)	(.2289)	(.2655)
bank size_1		-.2348	-.1729	-.1585	-.1997
		(.1039)	(.1399)	(.1381)	(.1706)
efficiency_1		.6100*	.5974	.8623**	.8952*
		(.3680)	(.4151)	(.4167)	(.4681)
liquidity_1 * Δmp				.0186	.0098
				(.0173)	(.0156)
liquidity_1 * Δmp_1				.0114	.0093
				(.0084)	(.0085)
capitalization_1 * Δmp				.0501*	.0703**
				(.0271)	(.0285)
capitalization_1 * Δmp_1				.0101	.0136
				(.0146)	(.0144)
bank size_1 * Δmp				.0241*	-.0002
				(.0139)	(.0164)
bank size_1 * Δmp_1				.0128*	.0048
				(.0075)	(.0078)
efficiency_1*Δmp				.0569	.0572
				(.0404)	(.0412)
efficiency_1*Δmp_1				.0243	.0110
				(.0201)	(.0204)
gr(gdp)	2.3544***	2.5724***	2.0207***	2.4572***	2.0827***
	(.4984)	(.4913)	(.5548)	(.5080)	(.5531)
inflation	-.1089	-.1187	-.0485	.0065	.2589
	(.0767)	(.0775)	(.1155)	(.1028)	(.1672)
depreciation	-.1901*	-.2065**	-.0828	-.3018***	-.3734
	(.1001)	(.0980)	(.2000)	(.1140)	(.2388)
constant	3.1661	-14.8040**	2.8600	-22.9205***	-8.1916
	(2.8508)	(5.8079)	(17.4076)	(6.4791)	(18.5836)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	903 (269)	900 (269)	900 (269)	900 (269)	900 (269)
R^2	0.1636	0.1866	0.2243	0.1994	0.2407

Table 2.6 (Continued)

Dependent Variable: gr(loans)

(Latin America)

	(1)	(2)	(3)	(4)	(5)
gr(loans)_1	.1255***	.1353***	.1274***	.1351***	.1277***
	(.0458)	(.0446)	(.0449)	(.0445)	(.0451)
gr(loans)_2	.0659	.0702	.0661	.0686	.0650
	(.0483)	(.0466)	(.0487)	(.0468)	(.0490)
Δmp	-.6274***	-.5896**	-.7185***	-.9838*	-1.0560*
	(.2345)	(.2268)	(.2356)	(.5833)	(.5984)
Δmp_1	-.6822**	-.6743**	-.6361*	-1.1572	-1.1953
	(.2880)	(.2914)	(.3419)	(.7140)	(.7724)
foreign	-6.8364***	-8.6567***	-8.7396***	-9.0445***	-9.1672***
	(2.5247)	(2.6485)	(2.7094)	(2.6405)	(2.6925)
state	-1.6620	-3.2933	-3.3676	-3.5754	-3.7752
	(3.5941)	(4.0478)	(4.2133)	(4.3110)	(4.4134)
foreign*Δmp	.5709**	.5484**	.5572**	.5221*	.5020*
	(.2528)	(.2461)	(.2524)	(.2797)	(.2742)
foreign*Δmp_1	.3445	.3859	.2085	.2596	.0797
	(.3111)	(.3189)	(.3579)	(.3074)	(.3355)
state *Δmp	1.5994***	1.6046***	1.4775***	1.4817***	1.3897***
	(.3299)	(.2999)	(.3541)	(.3678)	(.4151)
state *Δmp_1	.2063	.2064	.3401	-.0598	.0922
	(.7506)	(.7071)	(.7379)	(.7453)	(.7766)
liquidity_1		.2335**	.2620**	.2423**	.2614**
		(.0987)	(.1235)	(.1005)	(.1245)
capitalization_1		.0985	.0847	.1022	.0866
		(.1681)	(.1740)	(.1669)	(.1698)
bank size_1		-.1627	-.3608*	-.0177	-.2478
		(.2262)	(.2151)	(.2395)	(.2383)
efficiency_1		-.1891*	-.1396	-.2088*	-.1598
		(.1105)	(.1170)	(.1186)	(.1267)
liquidity_1 * Δmp				.0057	.0072
				(.0085)	(.0089)
liquidity_1 * Δmp_1				.0022	.0066
				(.0110)	(.0114)
capitalization_1 * Δmp				.0091	.0079
				(.0214)	(.0217)
capitalization_1 * Δmp_1				.0126	.0114
				(.0256)	(.0263)
bank size_1 * Δmp				.0348	.0264
				(.0312)	(.0325)
bank size_1 * Δmp_1				.0805*	.0800*
				(.0458)	(.0470)
efficiency_1*Δmp				.0019	-.0001
				(.0047)	(.0051)
efficiency_1*Δmp_1				.0099	.0071
				(.0063)	(.0067)
gr(gdp)	.5043	.3673	.1547	.4270	.3020
	(.3720)	(.3851)	(.5170)	(.3825)	(.5356)
inflation	-.2524	-.1037	-.5504**	-.0970	-.4890*
	(.1666)	(.1869)	(.2721)	(.1913)	(.2934)
depreciation	.0259	-.0042	.0468	-.0034	.0383
	(.0420)	(.0411)	(.0499)	(.0398)	(.0481)
constant	5.1683**	-1.3402	-3.8301	-1.6452	-3.7183
	(2.1906)	(4.7204)	(7.5074)	(4.7158)	(7.4098)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	1204 (395)	1203 (394)	1203 (394)	1203 (394)	1203 (394)
R^2	0.0726	0.0901	0.1059	0.0947	0.1103

Table 2.6 (Continued)

Dependent Variable: gr(loans)

(Asia)

	(1)	(2)	(3)	(4)	(5)
gr(loans)_1	.1463***	.1505***	.1628***	.1592***	.1709***
	(.0439)	(.0471)	(.0486)	(.0486)	(.0509)
gr(loans)_2	-.0254	-.0168	-.0421	-.0226	-.0460
	(.0373)	(.0377)	(.0374)	(.0392)	(.0392)
Δmp	-.8313**	-.8842**	-.8644**	-.4479	-.4014
	(.3638)	(.3622)	(.4040)	(.6647)	(.6776)
Δmp_1	-1.5859***	-1.4565***	-1.0607***	-1.4352**	-1.1432*
	(.2684)	(.2648)	(.4009)	(.6583)	(.6697)
foreign	-7.4528**	-6.8768**	-4.3326	-6.9709**	-4.5553
	(2.8650)	(2.8854)	(3.0793)	(2.9510)	(3.1318)
state	6.4136**	3.7261	2.1794	3.1161	1.5983
	(2.6650)	(2.6875)	(2.9499)	(2.7307)	(3.0569)
foreign*Δmp	.0020	-.0953	-.1013	-.4794	-.4419
	(.4456)	(.4286)	(.4345)	(.4631)	(.4578)
foreign*Δmp_1	-.2854	-.2823	-.2673	-.2731	-.2750
	(.3762)	(.3728)	(.3776)	(.4385)	(.4359)
state *Δmp	2.2961**	1.8896**	2.4345**	1.5661	1.9172*
	(.9351)	(.9487)	(1.0047)	(1.0344)	(1.0874)
state *Δmp_1	3.2436***	2.7679***	2.6703***	2.6406***	2.6169***
	(.8584)	(.8579)	(.8750)	(.9504)	(.9737)
liquidity_1		.1512**	.2118**	.1264	.1797
		(.0673)	(.1016)	(.0771)	(.1130)
capitalization_1		-.2402**	-.2266*	-.2840**	-.2570*
		(.1144)	(.1235)	(.1260)	(.1403)
bank size_1		-.1890	-.0762	-.0727	.0619
		(.1852)	(.2252)	(.2154)	(.2797)
efficiency_1		-.7248	-.7401	-.1009	-.2303
		(.5741)	(.6207)	(.6342)	(.7111)
liquidity_1 * Δmp				-.0107	-.0105
				(.0102)	(.0104)
liquidity_1 * Δmp_1				-.0021	-.0014
				(.0093)	(.0094)
capitalization_1 * Δmp				-.0256	-.0213
				(.0273)	(.0277)
capitalization_1 * Δmp_1				.0050	.0062
				(.0234)	(.0240)
bank size_1 * Δmp				.0582	.1148
				(.0716)	(.0889)
bank size_1 * Δmp_1				.0600	.0391
				(.0649)	(.0584)
efficiency_1*Δmp				.0755	.0614
				(.0514)	(.0510)
efficiency_1*Δmp_1				.0263	.0268
				(.0402)	(.0407)
gr(gdp)	.0723	-.0013	-.4853	.0624	-.4544
	(.3673)	(.3964)	(.6735)	(.4075)	(.6934)
inflation	-.0932	-.2858	-2.4130**	-.2874	-2.2940**
	(.2908)	(.3110)	(.9574)	(.3096)	(.9784)
depreciation	-.5335***	-.4396**	-.4404	-.4190**	-.4241
	(.1836)	(.1943)	(.3723)	(.1979)	(.3860)
constant	9.0597***	10.0327**	-1.9799	9.1268**	-1.6555
	(2.3806)	(4.0497)	(7.0064)	(4.5568)	(7.3841)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	917 (241)	903 (241)	903 (241)	903 (241)	903 (241)
R^2	0.1756	0.1993	0.2205	0.2061	0.2261

Table 2.6 (Continued)

Dependent Variable: gr(deposits)

(ALL)

	(1)	(2)	(3)	(4)	(5)
gr(deposits)_1	.0623**	.0720***	.0360	.0689**	.0340
	(.0271)	(.0271)	(.0272)	(.0271)	(.0271)
gr(deposits)_2	.0624***	.0669***	.0336	.0673***	.0356
	(.0226)	(.0227)	(.0229)	(.0226)	(.0228)
Δmp	-.4897***	-.4552***	-.5679***	-.5141*	-.6250**
	(.1409)	(.1407)	(.1552)	(.2629)	(.2671)
Δmp_1	-.4134**	-.4238**	-.5062**	-.0895	-.4044*
	(.2058)	(.1986)	(.2142)	(.2422)	(.2452)
foreign	-4.2409***	-3.8374**	-2.9986*	-4.4054***	-3.5402**
	(1.4651)	(1.5157)	(1.5895)	(1.5187)	(1.5831)
state	-2.1101	.5366	.7810	.0514	.3403
	(1.5745)	(1.6646)	(1.7013)	(1.6427)	(1.7123)
foreign*Δmp	.3679**	.3652**	.3862**	.2963*	.2930*
	(.1628)	(.1610)	(.1669)	(.1685)	(.1704)
foreign*Δmp_1	.0501	.0556	.0591	-.1123	-.0614
	(.2139)	(.2082)	(.2149)	(.1576)	(.1624)
state *Δmp	.7392***	.7561***	.7171***	.6288***	.6270***
	(.1809)	(.1805)	(.1905)	(.2040)	(.2175)
state *Δmp_1	.7579***	.7710***	.8438***	.6621***	.7067***
	(.2530)	(.2516)	(.2481)	(.2090)	(.2274)
liquidity_1		-.1018***	-.1938***	-.0937**	-.1787***
		(.0388)	(.0499)	(.0404)	(.0511)
capitalization_1		.2945***	.2547**	.2804***	.2421**
		(.0975)	(.1055)	(.0991)	(.1071)
bank size_1		-.0485	-.1847**	.0554	-.1048
		(.0734)	(.0920)	(.0832)	(.1091)
efficiency_1		-.0445	-.0680	-.0600	-.0896
		(.0928)	(.1009)	(.0997)	(.1082)
liquidity_1 * Δmp				.0049	.0052
				(.0040)	(.0041)
liquidity_1 * Δmp_1				.0008	.0057*
				(.0031)	(.0033)
capitalization_1 * Δmp				-.0120*	-.0119*
				(.0069)	(.0069)
capitalization_1 * Δmp_1				-.0276***	-.0262***
				(.0093)	(.0087)
bank size_1 * Δmp				.0299**	.0241*
				(.0117)	(.0144)
bank size_1 * Δmp_1				.0141*	.0156*
				(.0073)	(.0083)
efficiency_1*Δmp				.0069	.0051
				(.0066)	(.0055)
efficiency_1*Δmp_1				.0149*	.0131
				(.0088)	(.0082)
gr(gdp)	1.0134***	1.0739***	.6939**	1.1268***	.7150**
	(.2311)	(.2322)	(.2870)	(.2249)	(.2839)
inflation	-.2138***	-.2206***	-.2406***	-.2267***	-.2641***
	(.0527)	(.0554)	(.0600)	(.0571)	(.0606)
depreciation	.0926***	.0840***	.1227***	.0983***	.1434***
	(.0303)	(.0306)	(.0317)	(.0314)	(.0331)
constant	8.2289***	7.5872***	28.9164***	7.4842***	29.1467***
	(1.3528)	(2.3673)	(7.3212)	(2.4775)	(7.3766)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	3024 (903)	3006 (902)	3006 (902)	3006 (902)	3006 (902)
R^2	0.0448	0.0555	0.1074	0.0657	0.1165

Table 2.6 (Continued)

Dependent Variable: gr(deposits)

(East & Central Europe)

	(1)	(2)	(3)	(4)	(5)
gr(deposits)_1	.0899**	.0966**	.0676	.1023**	.0773
	(.0447)	(.0457)	(.0491)	(.0447)	(.0479)
gr(deposits)_2	.0338	.0258	.0003	.0288	.0032
	(.0377)	(.0360)	(.0372)	(.0369)	(.0372)
Δmp	-.0594	.1137	.0265	-1.6547	-1.7265
	(.2867)	(.3321)	(.4368)	(1.0725)	(1.1559)
Δmp_1	-.6516	-.4818	-.6275	.4244	.7151
	(.5983)	(.5631)	(.6068)	(.6912)	(.7418)
foreign	-2.2842	1.9823	7.1443*	1.2037	7.0488*
	(2.9990)	(3.4463)	(3.9945)	(3.2643)	(3.7369)
state	-2.7905	.7175	5.1509	.5694	5.8054
	(4.2223)	(4.0914)	(4.1794)	(3.9328)	(4.0384)
foreign*Δmp	-.1519	-.0596	-.3017	-.1864	-.4618
	(.4578)	(.4672)	(.4644)	(.5208)	(.5022)
foreign*Δmp_1	.7967	.6300	.7365	.2425	.2910
	(.5957)	(.5524)	(.5831)	(.3365)	(.3481)
state *Δmp	.2683	.1202	-.3885	.4359	-.2213
	(.3500)	(.3734)	(.4702)	(.5683)	(.5786)
state *Δmp_1	1.0212*	.7862	.8391	.5352	.5944
	(.6188)	(.5913)	(.6127)	(.3895)	(.3937)
liquidity_1		-.2251**	-.2451**	-.1755*	-.2009*
		(.0910)	(.1016)	(.1007)	(.1122)
capitalization_1		.7532***	.7235***	.6938***	.7261***
		(.2188)	(.2490)	(.2134)	(.2461)
bank size_1		-.3395***	-.3166*	-.3377**	-.4512**
		(.1221)	(.1777)	(.1462)	(.1848)
efficiency_1		-.2157	-.4112	-.0105	-.2328
		(.4239)	(.4863)	(.4853)	(.5559)
liquidity_1 * Δmp				.0298**	.0262*
				(.0135)	(.0137)
liquidity_1 * Δmp_1				-.0027	-.0064
				(.0079)	(.0086)
capitalization_1 * Δmp				.0229	.0386
				(.0305)	(.0353)
capitalization_1 * Δmp_1				-.0386***	-.0405***
				(.0139)	(.0134)
bank size_1 * Δmp				.0157	-.0164
				(.0174)	(.0187)
bank size_1 * Δmp_1				.0030	-.0090
				(.0096)	(.0102)
efficiency_1*Δmp				.0078	.0124
				(.0505)	(.0459)
efficiency_1*Δmp_1				.0234	.0077
				(.0193)	(.0207)
gr(gdp)	2.2658***	2.4088***	1.5104**	2.6297***	1.7379***
	(.5225)	(.5231)	(.6014)	(.4924)	(.5617)
inflation	-.4877***	-.4515***	-.3907***	-.4038***	-.2723*
	(.0695)	(.0721)	(.1035)	(.0815)	(.1635)
depreciation	.2904***	.2297**	.3959**	.1828	.2749
	(.0966)	(.1010)	(.1961)	(.1127)	(.2428)
constant	11.6446	10.1852	21.0662*	6.9125	16.0184
	(3.0986)	(7.2164)	(11.4920)	(8.1755)	(12.1412)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	905 (269)	902 (269)	902 (269)	902 (269)	902 (269)
R^2	0.0893	0.1344	0.1715	0.1525	0.1916

Table 2.6 (Continued)

Dependent Variable: gr(deposits)

(Latin America)

	(1)	(2)	(3)	(4)	(5)
gr(deposits)_1	.0069	.0121	-.0024	.0072	-.0075
	(.0414)	(.0419)	(.0420)	(.0420)	(.0417)
gr(deposits)_2	.0376	.0427	.0379	.0469	.0423
	(.0354)	(.0353)	(.0364)	(.0348)	(.0358)
Δmp	-.6849***	-.7130***	-.8969***	-.7449**	-.9311***
	(.2067)	(.2083)	(.2170)	(.3293)	(.3362)
Δmp_1	-.4601*	-.5196*	-.8662***	-.4185	-.8309**
	(.2745)	(.2739)	(.2923)	(.3857)	(.4132)
foreign	-6.2554***	-5.6471**	-5.9987**	-6.2955**	-6.6726***
	(2.3534)	(2.4532)	(2.5326)	(2.4348)	(2.5353)
state	-5.1373*	-2.1359	-1.2667	-2.9327	-2.0005
	(2.8832)	(3.0879)	(3.2301)	(3.0387)	(3.0408)
foreign*Δmp	.5659***	.6046***	.6310***	.4869**	.4887**
	(.2150)	(.2127)	(.2073)	(.2375)	(.2293)
foreign*Δmp_1	.1271	.1778	.2740	.0428	.1313
	(.2811)	(.2817)	(.2978)	(.2706)	(.2916)
state *Δmp	1.0879***	1.1175***	.9465***	.9392***	.7280**
	(.2297)	(.2313)	(.2566)	(.2646)	(.2874)
state *Δmp_1	.9844	1.0479	.9633	.7793	.6905
	(.6287)	(.6442)	(.6319)	(.6559)	(.6349)
liquidity_1		-.1536**	-.1969**	-.1524**	-.1978**
		(.0666)	(.0825)	(.0682)	(.0854)
capitalization_1		.1628	.1298	.2020	.1661
		(.1423)	(.1456)	(.1493)	(.1533)
bank size_1		-.1741	-.2965	-.1210	-.2554
		(.2015)	(.1987)	(.2082)	(.2145)
efficiency_1		-.0571	-.0785	-.0757	-.0963
		(.1121)	(.1098)	(.1254)	(.1197)
liquidity_1 * Δmp				.0040	.0054
				(.0057)	(.0058)
liquidity_1 * Δmp_1				.0065	.0102
				(.0083)	(.0088)
capitalization_1 * Δmp				-.0107	-.0117
				(.0083)	(.0086)
capitalization_1 * Δmp_1				-.0248**	-.0248**
				(.0117)	(.0121)
bank size_1 * Δmp				.0246	.0265
				(.0290)	(.0289)
bank size_1 * Δmp_1				.0238	.0271
				(.0332)	(.0338)
efficiency_1*Δmp				.0042	.0034
				(.0058)	(.0050)
efficiency_1*Δmp_1				.0095	.0085
				(.0083)	(.0076)
gr(gdp)	-.1147	-.0908	-.1670	-.1653	-.2817
	(.3561)	(.3644)	(.4931)	(.3751)	(.5135)
inflation	.2018	.1477	-.2561	.1447	-.3010
	(.2557)	(.2597)	(.3522)	(.2688)	(.3638)
depreciation	.0308	.0382	.0926*	.0492	.1045
	(.0390)	(.0404)	(.0513)	(.0421)	(.0540)
constant	5.3013**	8.2931**	16.1135***	8.0013*	15.7640**
	(2.3216)	(3.9082)	(6.1272)	(4.0845)	(6.2520)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	1203 (393)	1202 (392)	1202 (392)	1202 (392)	1202 (392)
R^2	0.0269	0.0356	0.0551	0.0428	0.0628

Table 2.6 (Continued)

Dependent Variable: gr(deposits)

(Asia)

	(1)	(2)	(3)	(4)	(5)
gr(deposits)_1	.0545	.0586	.0593	.0696	.0693
	(.0466)	(.0488)	(.0509)	(.0439)	(.0463)
gr(deposits)_2	.0473	.0438	.0266	.0428	.0254
	(.0438)	(.0447)	(.0455)	(.0439)	(.0446)
Δmp	-.4654**	-.4744**	-.5547**	.3445	.2839
	(.2073)	(.2101)	(.2460)	(.8072)	(.7965)
Δmp_1	-.2141	-.2846	-.5520*	-.5915	-.8862*
	(.1737)	(.1759)	(.3346)	(.4623)	(.5226)
foreign	-7.3007***	-7.7265***	-6.9285**	-7.1295***	-6.4801**
	(2.5911)	(2.6849)	(2.7891)	(2.6724)	(2.8074)
state	.5925	1.8628	-.3966	.8141	-1.0382
	(1.9826)	(2.0736)	(2.2995)	(2.1379)	(2.3740)
foreign*Δmp	-.3928	-.3948	-.3254	-.4764	-.4649
	(.3888)	(.3944)	(.3957)	(.5401)	(.5411)
foreign*Δmp_1	-.7496***	-.7557***	-.7131***	-.5855**	-.5590*
	(.2533)	(.2523)	(.2536)	(.2866)	(.2867)
state *Δmp	.9841	1.1972	.9632	.5941	.2942
	(.8193)	(.7927)	(.7962)	(.9092)	(.8896)
state *Δmp_1	.9785**	1.1226**	.9177*	1.0105*	.9062
	(.4916)	(.4998)	(.5249)	(.5543)	(.5729)
liquidity_1		-.0591	-.1443*	-.0464	-.1320
		(.0564)	(.0795)	(.0627)	(.0850)
capitalization_1		.0954	.1740	-.1017	-.0315
		(.1328)	(.1423)	(.1580)	(.1810)
bank size_1		-.1876	.1258	-.1418	.1614
		(.1385)	(.1883)	(.1441)	(.2407)
efficiency_1		.1488	.3696	.1690	.4241
		(.4178)	(.4319)	(.5412)	(.5573)
liquidity_1 * Δmp				.0054	.0026
				(.0108)	(.0110)
liquidity_1 * Δmp_1				.0044	.0048
				(.0060)	(.0059)
capitalization_1 * Δmp				-.0886**	-.0839*
				(.0432)	(.0439)
capitalization_1 * Δmp_1				-.0113	-.0107
				(.0145)	(.0145)
bank size_1 * Δmp				.0228	.0871
				(.0605)	(.0692)
bank size_1 * Δmp_1				.0581	.0223
				(.0448)	(.0463)
efficiency_1*Δmp				.0061	.0139
				(.0526)	(.0540)
efficiency_1*Δmp_1				.0332	.0348
				(.0401)	(.0406)
gr(gdp)	.6818	.6550	.4788	.7064*	.5066
	(.4247)	(.4234)	(.5894)	(.4090)	(.5539)
inflation	-.4408*	-.4296	-.2856	-.5004*	-.4065
	(.2443)	(.2676)	(.7680)	(.2654)	(.8061)
depreciation	.1656	.0938	-.0540	.1077	-.0742
	(.1416)	(.1464)	(.3539)	(.1453)	(.3265)
constant	7.9562***	9.0508**	10.0668*	10.3264**	11.4104*
	(2.6736)	(4.0974)	(5.5330)	(4.5411)	(5.8208)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	916 (241)	902 (241)	902 (241)	902 (241)	902 (241)
R^2	0.0853	0.0883	0.1131	0.1116	0.1347

Table 2.6 (Continued)

Dependent Variable: gr(liquidity)	(1) ALL	(2) ALL	(3) ECE	(4) LA	(5) ASIA
gr(liquidity)_1	-.0686**	-.0777**	-.0637**	-.1192*	-.0108
	(.0323)	(.0385)	(.0300)	(.0707)	(.0150)
Δmp	.2303	.3264	.3557	-.0113	.5463
	(.9644)	(1.0394)	(1.0261)	(2.0263)	(1.2417)
Δmp_1	1.4710	1.3786	1.6702***	1.6222	-1.2110
	(.9218)	(.9815)	(.5755)	(2.1144)	(1.6509)
foreign	-3.4182	-.9882	5.4543	2.2282	-4.6255
	(7.3826)	(7.5368)	(4.7673)	(14.4028)	(4.9625)
state	-.0524	3.5754	1.0197	16.4274	7.0073
	(4.7323)	(4.6407)	(4.7276)	(13.1651)	(5.8168)
foreign*Δmp	-.1883	-.0801	-.1545	-.2554	-.5112
	(.9076)	(.9576)	(.4832)	(1.5889)	(.4446)
foreign*Δmp_1	-1.2224**	-1.0358**	-.5229**	-2.3805*	-.5665
	(.4886)	(.4326)	(.2622)	(1.2993)	(.5499)
state *Δmp	-.0911	.0222	-.1723	.5748	-.9223
	(.7704)	(.8010)	(.3703)	(1.5612)	(1.0869)
state *Δmp_1	-.2288	-.1164	-.1194	-1.1058	3.3254
	(.6383)	(.6057)	(.2662)	(1.4619)	(2.8240)
liquidity_1	-1.5192***	-1.7141***	-.8260***	-2.5748***	-.8687***
	(.2756)	(.2777)	(.1178)	(.5905)	(.1582)
capitalization_1	1.2125	1.2743	.0487	1.5546	.1649
	(.8760)	(.9543)	(.2016)	(1.2783)	(.2505)
bank size_1	-1.4292***	-1.3193***	-.7592***	-3.6075***	-.2731
	(.4698)	(.4726)	(.2858)	(1.3015)	(.4942)
efficiency_1	-.3527	-.8334	-1.0049**	-1.3247	.6379
	(.4977)	(.6813)	(.4577)	(.8064)	(1.5726)
liquidity_1 * Δmp	-.0272	-.0303	.0046	-.0539	-.0187
	(.0288)	(.0293)	(.0121)	(.0703)	(.0149)
liquidity_1 * Δmp_1	-.0348**	-.0332**	-.0081	-.0708	-.0249
	(.0148)	(.0134)	(.0066)	(.0589)	(.0152)
capitalization_1 * Δmp	.0828	.0838	-.0126	.1627	.0242
	(.0904)	(.0896)	(.0187)	(.1509)	(.0369)
capitalization_1 * Δmp_1	.0609	.0603	-.0385***	.1664	.0532
	(.0642)	(.0628)	(.0085)	(.1438)	(.0408)
bank size_1 * Δmp	-.0411	-.0506	-.0125	.0154	.0209
	(.0513)	(.0511)	(.0222)	(.0822)	(.1210)
bank size_1 * Δmp_1	-.0559**	-.0556**	-.0289***	-.2065	.0508
	(.0250)	(.0227)	(.0098)	(.1674)	(.1923)
efficiency_1*Δmp	-.0086	-.0140	-.0197**	-.0226	-.1131
	(.0111)	(.0133)	(.0100)	(.0521)	(.0954)
efficiency_1*Δmp_1	.0101	.0079	.0076	-.0088	-.0794
	(.0193)	(.0188)	(.0170)	(.0480)	(.0723)
gr(gdp)	.5023	1.3720	1.7225***	2.8919	-.7720
	(.8471)	(1.1359)	(.7008)	(2.8217)	(1.3460)
inflation	.2233	-.0220	-.5460***	.9319	4.7915**
	(.2818)	(.3310)	(.0961)	(1.3537)	(1.9558)
depreciation	.0490	.0939	.3973***	-.0838	-1.1607
	(.1191)	(.1353)	(.1474)	(.3535)	(.9515)
constant	67.9893***	118.6203***	77.0232***	131.0896***	57.3290***
	(10.9425)	(22.2976)	(12.6328)	(40.6271)	(14.24)
country effect	No	Yes	Yes	Yes	Yes
year effect	No	Yes	Yes	Yes	Yes
Obs (num of banks)	3969 (1043)	3969 (1043)	1181 (311)	1644 (463)	1144 (269)
R^2	0.0404	0.0551	0.1594	0.0672	0.1270

Note: Heterogeneity robust standard error in parenthesis, allowing for serial correlation in cluster (bank).

Table 2. 7 Long-run Effects of Monetary Policy on Growth of Loans and Deposits

Dependent variable: gr(loans)					
	OVERALL	OVERALL	ECE	LA	ASIA
	(2)	(3)	(3)	(3)	(3)
(Long-run multiplier)					
ΔMP_{jt}	-1.6333***	-1.5977***	-.9214	-1.6799***	-2.1894**
	(0.3286)	(0.3366)	(0.7229)	(0.5894)	(0.8727)
foreign* ΔMP_{jt}	1.0092**	0.7653*	0.7965	0.9496	-0.4192
	(0.4297)	(0.4691)	(0.9241)	(0.6328)	(0.8876)
ΔMP_{jt} on foreign banks	-0.6241*	-0.8324**	-0.1249	-0.7303*	-2.6086***
	(0.3356)	(0.3508)	(0.7232)	(0.4197)	(0.8884)
Country effect	No	Yes	Yes	Yes	Yes
Year effect	No	Yes	Yes	Yes	Yes

Dependent variable: gr(loans)					
	OVERALL	OVERALL	ECE	LA	ASIA
	(4)	(5)	(5)	(5)	(5)
(Long-run multiplier)					
ΔMP_{jt}	-1.7375***	-1.7497***	-2.0536**	-1.4946**	-1.7427**
	(0.3967)	(0.4168)	(0.8113)	(0.6272)	(0.8182)
foreign* ΔMP_{jt}	1.0793**	0.8368*	1.0112	0.7209	-0.8193
	(0.4992)	(0.4691)	(0.8624)	(0.6390)	(0.9359)
ΔMP_{jt} on foreign banks	-0.6582**	-0.9129**	-1.0424	-0.7737	-2.5620***
	(0.3120)	(0.3240)	(0.6649)	(0.5460)	(0.9655)
Country effect	No	Yes	Yes	Yes	Yes
Year effect	No	Yes	Yes	Yes	Yes

Dependent variable: gr(deposits)					
	OVERALL	OVERALL	ECE	LA	ASIA
	(2)	(3)	(3)	(3)	(3)
(Long-run multiplier)					
ΔMP_{jt}	-1.0210***	-1.1547***	-0.6448	-1.8281***	-1.2109**
	(0.3367)	(0.3464)	(0.9703)	(0.4475)	(0.5205)
foreign* ΔMP_{jt}	0.4889	0.4787	0.4664	0.9384**	-1.1363*
	(0.3627)	(0.3495)	(0.8817)	(0.4396)	(0.5877)
ΔMP_{jt} on foreign banks	-0.5321**	-0.6760***	-0.1784	-0.8897***	-2.3472***
	(0.2154)	(0.2295)	(0.4696)	(0.3258)	(0.6940)
Country effect	No	Yes	Yes	Yes	Yes
Year effect	No	Yes	Yes	Yes	Yes

Table 2.7 (Continued)

Dependent variable: gr(deposits)					
	OVERALL	OVERALL	ECE	LA	ASIA
	(4)	(5)	(5)	(5)	(5)
(Long-run multiplier)					
ΔMP_{jt}	-0.7867**	-1.0051***	-0.2103	-1.6829***	-1.0447
	(0.2677)	(0.2792)	(0.6449)	(0.4678)	(0.6575)
foreign* ΔMP_{jt}	0.2130	0.2489	-0.1857	0.6423	-1.1310
	(0.3127)	(0.2993)	(0.6431)	(0.4563)	(0.7357)
ΔMP_{jt} on foreign banks	-0.5737***	-0.7562***	-0.3960	-1.0406***	-2.1757***
	(0.2197)	(0.2267)	(0.4839)	(0.3883)	(0.7958)
Country effect	No	Yes	Yes	Yes	Yes
Year effect	No	Yes	Yes	Yes	Yes

Notes: ECE represents “Eastern & Central Europe”, LA “Latin America” and ASIA “Asia”. Standard errors that are calculated by delta method are in parenthesis. The number in the second row indicates the specification in Table 2.6.

Table 2. 8 The Impact and Long-run Effects of Monetary Policy on Banks in Asia (without Indonesia)

Dependent variable: gr(loans) (Asian countries without Indonesia)	(1)	(2)	(3)	(4)	(5)
Δmp	-1.3813	-1.8511	-1.3428	-.4153	.4132
	(1.1114)	(1.2148)	(1.0437)	(1.8708)	(1.9840)
Δmp_1	-.5063	-.6495	-.4252	-1.7624	-1.2133
	(.4425)	.4209	(.6280)	(1.2956)	(1.3190)
foreign*Δmp	2.9811*	3.1301**	2.7257 *	3.0684**	2.5548**
	(1.5859)	(1.5631)	(1.4775)	(1.4507)	(1.2662)
foreign*Δmp_1	-1.0614	.0802	-.1485	-.0602	-.4105
	(1.1670)	(.9297)	(.9332)	(.8838)	(.9685)
obs (banks)	766 (194)	754 (194)	754 (194)	754 (194)	754 (194)
R^2	0.0637	0.0836	0.1069	0.1058	0.1283

Note: Based on specification (4) and (5), the calculated impact effects, -1.7378 and -1.5367, are very similar to that based on specification (1)-(3).

Dependent variable: gr(loans) Asian countries without Indonesia	(3)	(5)
(long-run multiplier)		
ΔMP	-1.9901*	-2.1212
	(1.2034)	(1.3703)
foreign*ΔMP	2.9008	2.3960
	(2.1532)	(1.8016)
ΔMP on foreign banks	0.9106	0.2748
	(1.5011)	(1.4259)

Table 2.8 (Continued)

Dependent variable: gr(deposits) (Asian countries without Indonesia)	(1)	(2)	(3)	(4)	(5)
Δmp	-.9834	-.7216	-.9030	2.1479	1.2950
	(.8416)	(.8755)	(.9002)	(1.7758)	(1.7855)
Δmp_1	.3124	.3829	-.1640	.2022	-.5325
	(.4127)	(.4474)	(.4983)	(1.2642)	(1.2458)
foreign*Δmp	.4195	.3274	.6816	1.0335	1.4877
	(1.3824)	(1.3946)	(1.3398)	(1.2059)	(1.1838)
foreign*Δmp_1	-.0228	-.2049	-.0145	-.8363	-.6596
	(.8339)	(.9581)	(.9558)	(.9202)	(.9519)
obs (banks)	765 (194)	753 (194)	753 (194)	753 (194)	753 (194)
R^2	0.0812	0.1171	0.0629	0.1196	0.1511

Notes: Based on specification (4) and (5), the calculated impact effects of ΔMP are -.4377 and -.6142, similar to that based on specification (1)-(3).

Dependent variable: gr(deposits) Asian countries without Indonesia	(3)	(5)
(long-run multiplier)		
ΔMP	-1.1896	-1.0285
	(1.1847)	(1.1977)
foreign*ΔMP	0.7436	0.9168
	(1.7740)	(1.7506)
ΔMP on foreign banks	-0.4460	-0.1117
	(1.3704)	(1.2300)

Table 2. 9 Effects of Monetary Policy on Interest Rates

Dependent Variable: d(loan rate)
(ALL)

	(1)	(2)	(3)	(4)	(5)
Δmp	.3409*** (.0435)	.3773*** (.0489)	.4404*** (.0525)	.9316*** (.2475)	.9484*** (.2457)
Δmp_1	.0839** (.0348)	.1115*** (.0368)	.1718*** (.0576)	.5884*** (.1835)	.5122*** (.1622)
foreign * Δmp	1.1784*** (.2184)	1.1424*** (.2167)	1.0046*** (.1826)	1.0049*** (.2122)	.8978*** (.1849)
foreign * Δmp_1	.1250 (.0992)	.1089 (.0987)	.0039 (.0949)	.1312 (.0845)	.0515 (.0883)
other bank characteristics	No	Yes	Yes	Yes	Yes
other bank characteristics * monetary policy	No	No	No	Yes	Yes
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
observations (num of banks)	3964 (1040)	3942 (1039)	3942 (1039)	3942 (1039)	3942 (1039)
R^2	0.3997	0.4046	0.4816	0.4357	0.5026

Dependent Variable: d(loan rate)

(Eastern & Central Europe)

	(1)	(2)	(3)	(4)	(5)
Δmp	.2432*** (.0410)	.2251*** (.0525)	.1757** (.0714)	.3269*** (.1109)	.2075* (.1180)
Δmp_1	.0570* (.0298)	.0463 (.0311)	.0372 (.0349)	-.0148 (.0678)	-.0173 (.0688)
foreign * Δmp	-.0036 (.0800)	.0088 (.0849)	.0259 (.0937)	.0348 (.0892)	.0331 (.0999)
foreign * Δmp_1	-.0348 (.0380)	-.0284 (.0380)	-.0231 (.0387)	-.0332 (.0433)	-.0309 (.0450)
other bank characteristics	No	Yes	Yes	Yes	Yes
other bank characteristics * monetary policy	No	No	No	Yes	Yes
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
observations (num of banks)	1182 (311)	1173 (310)	1173 (310)	1173 (310)	1173 (310)
R^2	0.2397	0.2516	0.3144	0.2863	0.3399

Table 2.9 (Continued)

Dependent Variable: d(loan rate)

(Latin America)

	(1)	(2)	(3)	(4)	(5)
Δmp	.6056*** (.1273)	.6291*** (.1222)	.8260*** (.1618)	.9674** (.4102)	1.0458** (.4256)
Δmp_1	.2848* (.1604)	.3180** (.1565)	.3348 (.2561)	.9272** (.3785)	.7264* (.3775)
foreign * Δmp	1.5338*** (.2536)	1.5056*** (.2534)	1.2697*** (.2264)	1.3729*** (.2899)	1.1819*** (.2594)
foreign * Δmp_1	.4570** (.2275)	.4712** (.2192)	.3633 (.2680)	.4696** (.2345)	.3770 (.2666)
other bank characteristics	No	Yes	Yes	Yes	Yes
other bank characteristics * monetary policy	No	No	No	Yes	Yes
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
observations (num of banks)	1638 (461)	1637 (461)	1637 (461)	1637 (461)	1637 (461)
R^2	0.4670	0.4752	0.5512	0.4923	0.5607

Dependent Variable: d(loan rate)

(Asia)

	(1)	(2)	(3)	(4)	(5)
Δmp	.4959*** (.0484)	.4797*** (.0440)	.5056*** (.0458)	.2133*** (.0660)	.2372*** (.0745)
Δmp_1	.1224*** (.0364)	.1247*** (.0355)	.1864*** (.0349)	.1959*** (.0543)	.2469*** (.0585)
foreign * Δmp	-.2603*** (.0612)	-.2703*** (.0612)	-.2718*** (.0619)	-.2614*** (.0518)	-.2627*** (.0528)
foreign * Δmp_1	-.0123 (.0268)	-.0179 (.0266)	-.0193 (.0266)	.0032 (.0280)	.0025 (.0277)
other bank characteristics	No	Yes	Yes	Yes	Yes
other bank characteristics * monetary policy	No	No	No	Yes	Yes
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
observations (num of banks)	1144 (268)	1132 (268)	1132 (268)	1132 (268)	1132 (268)
R^2	0.7071	0.7181	0.7309	0.7514	0.7651

Table 2.9 (Continued)

Dependent Variable: d(deposit rate)

(ALL)

	(1)	(2)	(3)	(4)	(5)
Δmp	.3024*** (.0372)	.3357*** (.0360)	.3949*** (.0429)	.9220*** (.2827)	.9291*** (.2786)
Δmp_1	.1233*** (.0312)	.1490*** (.0324)	.2216*** (.0451)	.7307*** (.1770)	.6389*** (.1807)
foreign * Δmp	1.2380*** (.2257)	1.2064*** (.2251)	1.0919*** (.1889)	1.1148*** (.2285)	1.0264*** (.1950)
foreign * Δmp_1	.2217* (.1151)	.1962* (.1130)	.0193 (.0922)	.2091** (.1031)	.0615 (.0842)
other bank characteristics	No	Yes	Yes	Yes	Yes
other bank characteristics * monetary policy	No	No	No	Yes	Yes
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
observations (num of banks)	3935 (1033)	3914 (1032)	3914 (1032)	3914 (1032)	3914 (1032)
R^2	0.3859	0.3898	0.4401	0.4125	0.4560

Dependent Variable: d(deposit rate)

(Eastern & Central Europe)

	(1)	(2)	(3)	(4)	(5)
Δmp	.1894*** (.0419)	.2059*** (.0419)	.1807*** (.0454)	.3129** (.1574)	.2772* (.1604)
Δmp_1	.1331*** (.0351)	.1347*** (.0348)	.1462*** (.0381)	.1703 (.1234)	.2280 (.1406)
foreign * Δmp	.1002 (.1052)	.0708 (.1042)	.0721 (.1015)	.1257 (.1040)	.1122 (.1083)
foreign * Δmp_1	-.0303 (.0496)	-.0394 (.0486)	-.0421 (.0465)	-.0397 (.0533)	-.0452 (.0499)
other bank characteristics	No	Yes	Yes	Yes	Yes
other bank characteristics * monetary policy	No	No	No	Yes	Yes
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
observations (num of banks)	1171 (309)	1163 (308)	1163 (308)	1163 (308)	1163 (308)
R^2	0.4031	0.3977	0.4093	0.4052	0.4165

Table 2.9 (Continued)

Dependent Variable: d(deposit rate)

(Latin America)

	(1)	(2)	(3)	(4)	(5)
Δmp	.6109*** (.1004)	.6030*** (.0929)	.7437*** (.1214)	1.1374** (.4453)	1.1676*** (.4442)
Δmp_1	.4219*** (.1154)	.4394*** (.1115)	.5070*** (.1909)	1.2846*** (.3634)	1.1168*** (.3933)
foreign * Δmp	1.6181*** (.2577)	1.6156*** (.2615)	1.4226*** (.2254)	1.6209*** (.3136)	1.4656*** (.2726)
foreign * Δmp_1	.6076*** (.2253)	.5913*** (.2115)	.3214 (.2194)	.6515** (.2540)	.3970* (.2373)
other bank characteristics	No	Yes	Yes	Yes	Yes
other bank characteristics * monetary policy	No	No	No	Yes	Yes
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
observations (num of banks)	1625 (459)	1624 (459)	1624 (459)	1624 (459)	1624 (459)
R^2	0.4525	0.4571	0.5008	0.4705	0.5085

Dependent Variable: d(deposit rate)

(Asia)

	(1)	(2)	(3)	(4)	(5)
Δmp	.4637*** (.0223)	.4475*** (.0241)	.4312*** (.0304)	.3933*** (.1098)	.3991*** (.1110)
Δmp_1	.0295 (.0953)	.0392 (.0937)	.0290 (.1003)	.1604 (.1126)	.1756 (.1210)
foreign * Δmp	-.1774*** (.0520)	-.1902*** (.0522)	-.1909*** (.0529)	-.1311* (.0779)	-.1307* (.0791)
foreign * Δmp_1	-.0064 (.0458)	-.0217 (.0458)	-.0253 (.0467)	-.0389 (.0519)	-.0488 (.0520)
other bank characteristics	No	Yes	Yes	Yes	Yes
other bank characteristics * monetary policy	No	No	No	Yes	Yes
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
observations (num of banks)	1139 (265)	1127 (265)	1127 (265)	1127 (265)	1127 (265)
R^2	0.2340	0.2485	0.2721	0.2573	0.2830

Note: Heterogeneity robust standard error in parenthesis, allowing serial correlation within clusters (banks).

Table 2. 10 Effects of Monetary Policy on Interest Rates without Extreme Values

Dependent Variable: d(loan rate)

(ALL observations after removing extreme interest rates)

	(1)	(2)	(3)	(4)	(5)
d(loan rate)_1	-.3294*** (.0346)	-.3276*** (.0347)	-.3557*** (.0326)	-.3262*** (.0350)	-.3551*** (.0327)
Δmp	.3578*** (.0286)	.3439*** (.0297)	.3268*** (.0301)	.3821*** (.0550)	.3846*** (.0582)
Δmp_1	.1144*** (.0235)	.1125*** (.0234)	.1274*** (.0230)	.2374*** (.0508)	.2071*** (.0531)
foreign	.6028** (.2533)	.5297** (.2546)	.4793** (.2328)	.3937 (.2543)	.3240 (.2310)
state	.1387 (.2381)	-.4193* (.2386)	-.2461 (.2339)	-.4574** (.2335)	-.0817 (.2184)
foreign * Δmp	-.0596 (.0554)	-.0528 (.0554)	-.0395 (.0538)	-.0636 (.0533)	-.0561 (.0516)
foreign * Δmp_1	.0014 (.0306)	.0016 (.0302)	-.0185 (.0298)	-.0141 (.0284)	-.0308 (.0284)
state * Δmp	-.1546*** (.0602)	-.1541*** (.0590)	-.1255** (.0566)	-.1363** (.0588)	-.1004* (.0595)
state * Δmp_1	-.1242*** (.0354)	-.1231*** (.0340)	-.1113*** (.0315)	-.1240*** (.0374)	-.1115*** (.0350)
liquidity_1		.0129** (.0055)	.0103 (.0067)	.0072 (.0061)	.0029 (.0069)
capitalization_1		-.0652*** (.0132)	-.0662*** (.0138)	-.0568*** (.0132)	-.0585*** (.0138)
bank size _1		.0305 (.0232)	.0041 (.0241)	.0180 (.0279)	-.0188 (.0255)
efficiency_1		-.0102 (.0204)	-.0168 (.0217)	-.0990*** (.0251)	-.1400*** (.0257)
liquidty_1 * Δmp				-.0004 (.0010)	-.0005 (.0010)
liquidty_1 * Δmp_1				-.0002 (.0007)	.0000 (.0007)
capitalization_1 * Δmp				-.0020 (.0013)	-.0017 (.0013)
capitalization_1 * Δmp_1				-.0036*** (.0013)	-.0026** (.0012)
bank size_1 * Δmp				-.0028 (.0038)	-.0044 (.0037)
bank size_1 * Δmp_1				-.0005 (.0017)	-.0006 (.0018)
efficiency_1 * Δmp				.0004 (.0007)	-.0007 (.0007)
efficiency_1 * Δmp_1				-.0043*** (.0014)	-.0027** (.0013)
gr(gdp)	-.0903*** (.0306)	-.1027*** (.0300)	.0091 (.0427)	-.0967*** (.0310)	.0287 (.0433)
inflation	-.0150 (.0135)	-.0128 (.0134)	-.0023 (.0229)	-.0125 (.0140)	-.0035 (.0237)
depreciation	.0218*** (.0065)	.0256*** (.0066)	.0275*** (.0072)	.0297*** (.0065)	.0310*** (.0072)
constant	-.2178 (.1761)	.3088 (.3426)	-.4192 (.6491)	1.0651*** (.3673)	.7466 (.6498)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
obs (num of banks)	3880 (1023)	3858 (1022)	3858 (1022)	3858 (1022)	3858 (1022)
R^2	0.2677	0.2783	0.3484	0.2877	0.3573

Table 2.10 (Continued)

Dependent Variable: d(loan rate)

(Eastern & Central Europe after removing extreme interest rates)

	(1)	(2)	(3)	(4)	(5)
d(loan rate)_1	-.2056***	-.1991***	-.2027***	-.2016***	-.2001***
	(.0336)	(.0358)	(.0403)	(.0387)	(.0418)
Δmp	.2432***	.2251***	.1757**	.3269***	.2075*
	(.0410)	(.0525)	(.0714)	(.1109)	(.1180)
Δmp_1	.0570*	.0463	.0372	-.0148	-.0173
	(.0298)	(.0311)	(.0349)	(.0678)	(.0688)
foreign	-.3475	-.5716*	-.1815	-.5773*	-.1102
	(.3055)	(.3191)	(.3614)	(.3254)	(.3747)
state	-.0334	-.2587	-.1906	-.1524	.0289
	(.3383)	(.3403)	(.3543)	(.3567)	(.3834)
foreign * Δmp	-.0036	.0088	.0259	.0348	.0331
	(.0800)	(.0849)	(.0937)	(.0892)	(.0999)
foreign * Δmp_1	-.0348	-.0284	-.0231	-.0332	-.0309
	(.0380)	(.0380)	(.0387)	(.0433)	(.0450)
state * Δmp	-.0743	-.0610	-.0106	-.0445	-.0036
	(.0796)	(.0849)	(.0923)	(.0748)	(.0841)
state * Δmp_1	-.0815*	-.0706	-.0601	-.0617	-.0581
	(.0474)	(.0473)	(.0488)	(.0480)	(.0526)
liquidity_1		.0012	.0008	-.0047	.0001
		(.0057)	(.0056)	(.0070)	(.0068)
capitalization_1		-.0378***	-.0327**	-.0242*	-.0248
		(.0142)	(.0150)	(.0138)	(.0156)
bank size _1		.0201	.0187	-.0014	-.0103
		(.0156)	(.0195)	(.0139)	(.0147)
efficiency_1		-.0101	-.0182**	-.0581	-.0543
		(.0071)	(.0092)	(.0430)	(.0473)
liquidty_1 * Δmp				-.0028*	-.0014
				(.0015)	(.0015)
liquidty_1 * Δmp_1				.0014	.0015*
				(.0009)	(.0009)
capitalization_1 * Δmp				.0038	.0041
				(.0029)	(.0030)
capitalization_1 * Δmp_1				-.0015	-.0019
				(.0011)	(.0011)
bank size_1 * Δmp				-.0042*	-.0049**
				(.0024)	(.0022)
bank size_1 * Δmp_1				.0003	-.0001
				(.0010)	(.0010)
efficiency_1 * Δmp				-.0019**	-.0015*
				(.0008)	(.0007)
efficiency_1 * Δmp_1				.0027*	.0020
				(.0016)	(.0016)
gr(gdp)	-.1878***	-.205***	-.1146**	-.2098***	-.1340***
	(.0358)	(.0382)	(.0490)	(.0391)	(.0500)
inflation	.0375**	.0377***	.0530**	.0394**	.0557**
	(.0189)	(.0191)	(.0230)	(.0190)	(.0232)
depreciation	-.0405***	-.0390***	-.0423**	-.0423***	-.0476***
	(.0109)	(.0123)	(.0174)	(.0117)	(.0151)
constant	.0740	.7337*	.3284	1.2216**	.4541
	(.2431)	(.4278)	(.6058)	(.5071)	(.6926)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
obs (num of banks)	1182 (311)	1173 (310)	1173 (310)	1173 (310)	1173 (310)
R^2	0.2397	0.2516	0.3144	0.2863	0.3399

Table 2.10 (Continued)

Dependent Variable: d(loan rate)

(Latin America after removing extreme interest rates)

	(1)	(2)	(3)	(4)	(5)
d(loan rate)_1	-.3513*** (.0419)	-.3533*** (.0414)	-.3772*** (.0383)	-.3517*** (.0420)	-.3748*** (.0384)
Δmp	.3722*** (.0455)	.3475*** (.0449)	.3788*** (.0531)	.4217*** (.1046)	.4237*** (.1201)
Δmp_1	.1351** (.0585)	.1825*** (.0553)	.1844*** (.0678)	.3424*** (.1132)	.2657** (.1256)
foreign	1.5994*** (.5117)	1.3100** (.5152)	.6729 (.4137)	1.2101** (.5153)	.5395 (.4132)
state	.2909 (.8638)	-.4687 (.6853)	-.0350 (.6623)	-.8762 (.7048)	-.4403 (.6481)
foreign * Δmp	-.0070 (.0837)	.0016 (.0837)	.0091 (.0769)	-.0123 (.0801)	-.0098 (.0735)
foreign * Δmp_1	.0368 (.0749)	-.0108 (.0718)	-.0321 (.0738)	-.0448 (.0716)	-.0676 (.0741)
state * Δmp	.0014 (.0955)	-.0144 (.0845)	.0337 (.0745)	-.0449 (.0865)	-.0027 (.0765)
state * Δmp_1	.0097 (.1236)	-.0892 (.1206)	-.0656 (.1254)	-.1643 (.1337)	-.1491 (.1332)
liquidity_1		.0188 (.0139)	.0130 (.0149)	.0191 (.0146)	.0136 (.0156)
capitalization_1		-.0793*** (.0209)	-.0741*** (.0199)	-.0674*** (.0216)	-.0647*** (.0205)
bank size _1		.1418 (.0973)	-.0222 (.0899)	.1727 (.1132)	.0146 (.0979)
efficiency_1		-.1377*** (.0334)	-.1429*** (.0317)	-.1339*** (.0358)	-.1436*** (.0326)
liquidty_1 * Δmp				.0001 (.0019)	.0003 (.0020)
liquidty_1 * Δmp_1				-.0003 (.0023)	.0004 (.0024)
capitalization_1 * Δmp				-.0033* (.0017)	-.0019 (.0016)
capitalization_1 * Δmp_1				-.0052* (.0029)	-.0027 (.0026)
bank size_1 * Δmp				.0005 (.0109)	.0031 (.0109)
bank size_1 * Δmp_1				.0197* (.0103)	.0263** (.0115)
efficiency_1 * Δmp				-.0023 (.0032)	-.0029 (.0031)
efficiency_1 * Δmp_1				-.0089* (.0050)	-.0091** (.0044)
gr(gdp)	.0719 (.0650)	.0815 (.0620)	.3584 (.1001)	.0824 (.0655)	.3603*** (.1036)
inflation	-.0340 (.0617)	-.0047 (.0614)	.1883* (.1047)	-.0086 (.0597)	.1808* (.1035)
depreciation	.0336*** (.0091)	.0351*** (.0090)	.0181 (.0135)	.0404*** (.0091)	.0233* (.0128)
constant	-.7272 (.4818)	.8536 (.9401)	-2.5410** (1.2010)	.6253 (1.0015)	-2.3579** (1.1929)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
obs (num of banks)	1554 (444)	1553 (444)	1553 (444)	1553 (444)	1553 (444)
R^2	0.2548	0.2758	0.3727	0.2819	0.3775

Table 2.10 (Continued)

Dependent Variable: d(loan rate)

(Asia after removing extreme interest rates)

	(1)	(2)	(3)	(4)	(5)
d(loan rate)_1	-.3004***	-.2942***	-.2944***	-.2637***	-.2426***
	(.0612)	(.0583)	(.0554)	(.0577)	(.0527)
Δmp	.4959***	.4797***	.5056***	.2133***	.2372***
	(.0484)	(.0440)	(.0458)	(.0660)	(.0745)
Δmp_1	.1224***	.1247***	.1864***	.1959***	.2469***
	(.0364)	(.0355)	(.0349)	(.0543)	(.0585)
foreign	-.3832***	-.2311	-.0425	-.1208	-.0972
	(.1316)	(.1431)	(.1589)	(.1363)	(.1580)
state	-.0129	-.1651	-.1858	-.2411	-.1489
	(.1097)	(.1452)	(.1186)	(.1552)	(.1147)
foreign * Δmp	-.2603***	-.2703***	-.2718***	-.2614***	-.2627***
	(.0612)	(.0612)	(.0619)	(.0518)	(.0528)
foreign * Δmp_1	-.0123	-.0179	-.0193	.0032	.0025
	(.0268)	(.0266)	(.0266)	(.0280)	(.0277)
state * Δmp	-.2531***	-.2654***	-.2844***	-.1733***	-.1530***
	(.0709)	(.0696)	(.0674)	(.0628)	(.0580)
state * Δmp_1	-.1410***	-.1525***	-.1869***	-.1662***	-.1809***
	(.0394)	(.0415)	(.0391)	(.0394)	(.0378)
liquidity_1		-.0039	-.0000	.0075**	.0117**
		(.0039)	(.0050)	(.0034)	(.0048)
capitalization_1		-.0378**	-.0434**	-.0394**	-.0505**
		(.0150)	(.0201)	(.0166)	(.0225)
bank size _1		-.0011	-.0016	.0019	-.0197
		(.0057)	(.0110)	(.0072)	(.0130)
efficiency_1		-.1098***	-.1262***	-.0426	-.0469
		(.0382)	(.0415)	(.0320)	(.0323)
liquidty_1 * Δmp				.0042***	.0043***
				(.0009)	(.0010)
liquidty_1 * Δmp_1				-.0002	-.0006
				(.0006)	(.0006)
capitalization_1 * Δmp				-.0008	-.0012
				(.0029)	(.0029)
capitalization_1 * Δmp_1				-.0020	-.0020
				(.0015)	(.0015)
bank size_1 * Δmp				-.0063	-.0176*
				(.0083)	(.0095)
bank size_1 * Δmp_1				-.0043	-.0036
				(.0046)	(.0042)
efficiency_1 * Δmp				.0108**	.0101*
				(.0054)	(.0056)
efficiency_1 * Δmp_1				-.0033	-.0038
				(.0039)	(.0040)
gr(gdp)	-.0585**	-.0622***	-.0350	-.0885***	-.0650**
	(.0240)	(.0215)	(.0238)	(.0250)	(.0286)
inflation	.0626***	.0677***	-.0422	.0979***	.0488
	(.0120)	(.0131)	(.0382)	(.0160)	(.0512)
depreciation	-.0442***	-.0371***	-.0152	-.0136	-.0099
	(.0086)	(.0085)	(.0138)	(.0128)	(.0151)
constant	-.2316*	.6523**	-.1426	-.0180	-.0384
	(.1358)	(.2684)	(.3683)	(.2284)	(.3720)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
obs (num of banks)	1144 (268)	1132 (268)	1132 (268)	1132 (268)	1132 (268)
R^2	0.7071	0.7181	0.7309	0.7514	0.7651

Table 2.10 (Continued)

Dependent Variable: d(deposit rate)

(ALL observations after removing extreme interest rates)

	(1)	(2)	(3)	(4)	(5)
d(deposit rate)_1	-.3436*** (.0406)	-.3347*** (.0421)	-.3856*** (.0401)	-.3349*** (.0420)	-.3850*** (.0402)
Δmp	.2989*** (.0255)	.3108*** (.0239)	.2924*** (.0245)	.2781*** (.0627)	.2791*** (.0645)
Δmp_1	.1133*** (.0271)	.1202*** (.0263)	.1485*** (.0288)	.2070*** (.0564)	.2096*** (.0580)
foreign	.7840*** (.2874)	.7437** (.2910)	.7351*** (.2704)	.7904*** (.2987)	.6942** (.2766)
state	.0355 (.3525)	-.3687 (.4126)	.0131 (.4278)	-.3059 (.4126)	.1647 (.4391)
foreign * Δmp	.0069 (.0524)	-.0026 (.0513)	.0097 (.0499)	.0191 (.0510)	.0259 (.0493)
foreign * Δmp_1	-.0378 (.0342)	-.0461 (.0336)	-.0669* (.0356)	-.0550* (.0314)	-.0795** (.0327)
state * Δmp	-.1089* (.0611)	-.1201** (.0601)	-.0906 (.0574)	-.0904 (.0566)	-.0507 (.0563)
state * Δmp_1	-.1004** (.0418)	-.1117*** (.0401)	-.1025** (.0408)	-.1044*** (.0335)	-.0950*** (.0360)
liquidity_1		.0151** (.0066)	.0180* (.0094)	.0151** (.0071)	.0148 (.0094)
capitalization_1		-.0566** (.0248)	-.0606** (.0262)	-.0538* (.0275)	-.0521* (.0284)
bank size _1		.0404* (.0232)	-.0016 (.0232)	.0295 (.0266)	-.0239 (.0241)
efficiency_1		.0324*** (.0083)	.0133 (.0092)	.0511 (.0329)	-.0353 (.0361)
liquidty_1 * Δmp				-.0004 (.0010)	-.0006 (.0010)
liquidty_1 * Δmp_1				-.0002 (.0007)	-.0002 (.0007)
capitalization_1 * Δmp				.0019 (.0020)	.0026 (.0020)
capitalization_1 * Δmp_1				-.0032** (.0014)	-.0028** (.0014)
bank size_1 * Δmp				-.0030 (.0031)	-.0052* (.0030)
bank size_1 * Δmp_1				-.0009 (.0015)	-.0015 (.0016)
efficiency_1 * Δmp				.0008 (.0011)	-.0011 (.0011)
efficiency_1 * Δmp_1				-.0011 (.0019)	.0007 (.0019)
gr(gdp)	-.0716** (.0340)	-.0690** (.0334)	.0635 (.0476)	-.0554 (.0346)	.0862* (.0491)
inflation	-.0205* (.0119)	-.0217* (.0120)	-.0279 (.0231)	-.0237* (.0125)	-.0236 (.0229)
depreciation	.0395*** (.0060)	.0419*** (.0061)	.0443*** (.0065)	.0418*** (.0063)	.0441*** (.0066)
constant	-.1011 (.1912)	-.1072 (.4537)	-1.4492 (.8846)	-.2736 (.4843)	-1.1080 (.8772)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
obs (num of banks)	3851 (1013)	3830 (1012)	3830 (1012)	3830 (1012)	3830 (1012)
R^2	0.2495	0.2536	0.3323	0.2570	0.3365

Table 2.10 (Continued)

Dependent Variable: d(deposit rate)

(Eastern & Central Europe after removing extreme interest rates)

	(1)	(2)	(3)	(4)	(5)
d(deposit rate)_1	-.2974***	-.1936***	-.2006***	-.1888***	-.1969***
	(.0480)	(.0661)	(.0692)	(.0667)	(.0703)
Δmp	.1808***	.1943***	.1705***	.3088**	.2455**
	(.0463)	(.0540)	(.0652)	(.1185)	(.1127)
Δmp_1	.0932**	.0807**	.0813**	.0438	.0742
	(.0357)	(.0370)	(.0384)	(.0743)	(.0757)
foreign	-.5063*	-.9628**	-.4173	-.8689***	-.2976
	(.2978)	(.2790)	(.3231)	(.3121)	(.3743)
state	-1.0014	-1.1331***	-.8434*	-1.0494***	-.6848
	(.6981)	(.3740)	(.4373)	(.3955)	(.4623)
foreign * Δmp	.0471	.0157	.0236	.0547	.0466
	(.0828)	(.0811)	(.0848)	(.0867)	(.0940)
foreign * Δmp_1	-.0457	-.0517	-.0477	-.0686	-.0673
	(.0414)	(.0397)	(.0380)	(.0491)	(.0488)
state * Δmp	.0091	-.0058	.0367	.0185	.0520
	(.0882)	(.0884)	(.0947)	(.0771)	(.0819)
state * Δmp_1	-.1122*	-.1210**	-.1146*	-.1159**	-.1124**
	(.0580)	(.0607)	(.0607)	(.0495)	(.0509)
liquidity_1		.0002	.0027	-.0033	.0013
		(.0065)	(.0068)	(.0079)	(.0078)
capitalization_1		-.0626***	-.0653***	-.0607**	-.0635***
		(.0202)	(.0199)	(.0243)	(.0231)
bank size _1		.0174	.0176	-.0049	-.0092
		(.0111)	(.0143)	(.0124)	(.0130)
efficiency_1		.0103*	.0038	.0406	.0212
		(.0054)	(.0071)	(.0366)	(.0423)
liquidty_1 * Δmp				-.0033**	-.0025*
				(.0016)	(.0014)
liquidty_1 * Δmp_1				.0015	.0014
				(.0011)	(.0010)
capitalization_1 * Δmp				.0039	.0042
				(.0036)	(.0034)
capitalization_1 * Δmp_1				-.0022*	-.0026**
				(.0012)	(.0011)
bank size_1 * Δmp				-.0049**	-.0054***
				(.0019)	(.0019)
bank size_1 * Δmp_1				-.0010	-.0017*
				(.0010)	(.0009)
efficiency_1 * Δmp				-.0006	-.0003
				(.0008)	(.0008)
efficiency_1 * Δmp_1				.0023	.0013
				(.0014)	(.0014)
gr(gdp)	-.0208	-.0275	.0189	-.0357	.0067
	(.0362)	(.0317)	(.0413)	(.0318)	(.0438)
inflation	.0396***	.0412***	.0522***	.0429***	.0557***
	(.0126)	(.0120)	(.0142)	(.0127)	(.0136)
depreciation	-.0278***	-.0270***	-.0403***	-.0340***	-.0511***
	(.0065)	(.0070)	(.0115)	(.0078)	(.0105)
constant	-.2068	.8620*	-.1042	.9139	-.2564
	(.2891)	(.4429)	(.5477)	(.5051)	(.6111)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
obs (num of banks)	1168 (309)	1160 (307)	1160 (307)	1160 (307)	1160 (307)
R^2	0.2582	0.2336	0.2915	0.2811	0.3332

Table 2.10 (Continued)

Dependent Variable: d(deposit rate)

(Latin America after removing extreme interest rates)

	(1)	(2)	(3)	(4)	(5)
d(deposit rate)_1	-.3595*** (.0508)	-.3654*** (.0502)	-.4166*** (.0479)	-.3606*** (.0506)	-.4150*** (.0478)
Δmp	.2889*** (.0429)	.3005*** (.0437)	.2599*** (.0523)	.3321*** (.1018)	.3192*** (.1160)
Δmp_1	.1088 (.0700)	.1269* (.0694)	.1153 (.1014)	.4133*** (.1265)	.3356** (.1423)
foreign	2.4081*** (.6042)	2.3950*** (.6217)	1.5916*** (.5223)	2.2524*** (.6174)	1.3821*** (.5248)
state	1.8158 (1.5190)	.6564 (1.5987)	2.0833 (1.5955)	.0256 (1.6022)	1.4972 (1.5422)
foreign * Δmp	.0335 (.0771)	.0246 (.0773)	.0527 (.0744)	.0466 (.0766)	.0630 (.0764)
foreign * Δmp_1	-.0815 (.0867)	-.0977 (.0867)	-.0947 (.0980)	-.1593** (.0803)	-.1514* (.0891)
state * Δmp	-.0251 (.1046)	-.0430 (.1078)	-.0467 (.0837)	-.0525 (.1234)	-.0404 (.1013)
state * Δmp_1	-.0508 (.1514)	-.0466 (.1507)	-.0060 (.1601)	-.1624 (.1490)	-.1049 (.1482)
liquidity_1		.0392** (.0154)	.0314 (.0192)	.0431*** (.0160)	.0346* (.0199)
capitalization_1		-.0493 (.0431)	-.0437 (.0404)	-.0292 (.0457)	-.0242 (.0423)
bank size _1		.2015** (.0941)	-.0543 (.0865)	.2763** (.1157)	.0109 (.1005)
efficiency_1		.0588 (.0446)	-.0062 (.0430)	.0446 (.0475)	-.0369 (.0443)
liquidty_1 * Δmp				-.0003 (.0020)	-.0002 (.0021)
liquidty_1 * Δmp_1				-.0048* (.0025)	-.0039 (.0027)
capitalization_1 * Δmp				.0015 (.0027)	.0026 (.0027)
capitalization_1 * Δmp_1				-.0043 (.0036)	-.0026 (.0033)
bank size_1 * Δmp				.0035 (.0102)	-.0005 (.0099)
bank size_1 * Δmp_1				.0357** (.0139)	.0385*** (.0135)
efficiency_1 * Δmp				-.0078** (.0034)	-.0112*** (.0035)
efficiency_1 * Δmp_1				-.0127** (.0054)	-.0139** (.0055)
gr(gdp)	.0142 (.0662)	.0214 (.0635)	.2123* (.1150)	.0557 (.0676)	.2663** (.1212)
inflation	-.0735* (.0404)	-.0565 (.0430)	-.1118 (.0725)	-.0697 (.0436)	-.1211* (.0733)
depreciation	.0562 (.0087)	.0554 (.0091)	.0637*** (.0105)	.0650*** (.0099)	.0738*** (.0107)
constant	-.4539 (.4057)	-1.9213* (1.0395)	-2.5024* (1.4924)	-2.3046** (1.1377)	-2.0845 (1.4481)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
obs (num of banks)	1546 (440)	1545 (440)	1545 (440)	1545 (440)	1545 (440)
R^2	0.2522	0.2603	0.3553	0.2725	0.3679

Table 2.10 (Continued)

Dependent Variable: d(deposit rate)

(Asia after removing extreme interest rates)

	(1)	(2)	(3)	(4)	(5)
d(deposit rate)_1	-.3119***	-.3047***	-.3023***	-.3009***	-.2981***
	(.1196)	(.1106)	(.1080)	(.1078)	(.1053)
Δmp	.4639***	.4417***	.4561***	.3772***	.4449***
	(.0217)	(.0226)	(.0290)	(.1008)	(.0949)
Δmp_1	.1196*	.1247*	.1463**	.2461***	.3056***
	(.0651)	(.0637)	(.0602)	(.0863)	(.0858)
foreign	-.8392***	-.4869*	-.2991	-.5718**	-.3625
	(.2102)	(.2490)	(.2850)	(.2436)	(.2931)
state	-.0769	-.3826	-.3444**	-.2951	-.2295
	(.1813)	(.3075)	(.1649)	(.3349)	(.1837)
foreign * Δmp	-.1874***	-.1984***	-.2011***	-.1449**	-.1496**
	(.0468)	(.0471)	(.0473)	(.0682)	(.0678)
foreign * Δmp_1	-.0472	-.0639	-.0673*	-.0794*	-.0883*
	(.0393)	(.0390)	(.0395)	(.0463)	(.0466)
state * Δmp	-.1186	-.1165	-.2141**	-.0203	-.0705
	(.0957)	(.0936)	(.0914)	(.1141)	(.1084)
state * Δmp_1	.0494	.0492	-.0301	.0153	-.0734
	(.0584)	(.0573)	(.0584)	(.0622)	(.0642)
liquidity_1		-.0132	-.0067	-.0137	-.0090
		(.0083)	(.0119)	(.0095)	(.0132)
capitalization_1		-.0946**	-.1140**	-.0858**	-.1070*
		(.0389)	(.0514)	(.0426)	(.0573)
bank size _1		-.0210*	-.0365	-.0327**	-.0626**
		(.0115)	(.0286)	(.0165)	(.0355)
efficiency_1		-.1118***	-.1247***	-.1395**	-.1567**
		(.0427)	(.0429)	(.0689)	(.0713)
liquidty_1 * Δmp				.0001	-.0004
				(.0011)	(.0012)
liquidty_1 * Δmp_1				-.0010*	-.0015**
				(.0006)	(.0006)
capitalization_1 * Δmp				.0075	.0069
				(.0074)	(.0073)
capitalization_1 * Δmp_1				-.0043*	-.0042
				(.0025)	(.0026)
bank size_1 * Δmp				-.0107	-.0307***
				(.0080)	(.0110)
bank size_1 * Δmp_1				-.0026	-.0038
				(.0050)	(.0052)
efficiency_1 * Δmp				-.0058	-.0077
				(.0072)	(.0074)
efficiency_1 * Δmp_1				-.0034	-.0037
				(.0045)	(.0044)
gr(gdp)	-.0331	-.0451	.0172	-.0397	.0304
	(.0584)	(.0530)	(.0611)	(.0569)	(.0657)
inflation	.0394*	.0362	.0145	.0247	-.0203
	(.0223)	(.0234)	(.0815)	(.0250)	(.0936)
depreciation	-.0387***	-.0243**	-.0453*	-.0330**	-.0541**
	(.0126)	(.0117)	(.0256)	(.0130)	(.0257)
constant	-.1151	1.7806***	.9530	1.8562***	1.0111
	(.2512)	(.5374)	(.7820)	(.6471)	(.8713)
country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
obs (num of banks)	1137 (265)	1125 (265)	1125 (265)	1125 (265)	1125 (265)
R^2	0.3838	0.4065	0.4342	0.4154	0.4455

Note: Heterogeneity robust standard error in parenthesis, allowing serial correlation within clusters (banks).

Table 2. 11 Results of Panel VAR

Domestic private banks				
Response of:	*Δmp(t)*	*grdeposits(t)*	*grlq(t)*	*grloans(t)*
Response to:				
Δmp(t-1)	.1123**	-.2410**	-.0204	-.6145***
	(.0435)	(.1099)	(.2309)	(.0898)
grdeposits(t-1)	-.0183**	-.0036	-.6545	.1172**
	(.0068)	(.0377)	(.6650)	(.0496)
grlq(t-1)	-.0013	.0049	-.0382*	.0069
	(.0035)	(.0039)	(.0213)	(.0049)
grloans(t-1)	.0331***	.0551*	.1167	.0175
	(.0070)	(.0331)	(.2322)	(.0454)
obs	1287			

Foreign banks				
Response of:	*Δmp(t)*	*grdeposits(t)*	*grlq(t)*	*grloans(t)*
Response to:				
Δmp(t-1)	.1213***	-.1469**	-.0454	-.3294***
	(.0286)	(.0620)	(.0978)	(.0797)
grdeposits(t-1)	-.0065	-.0181	.0724	.0201
	(.0062)	(.0341)	(.0784)	(.0293)
grlq(t-1)	.0023	.0108*	-.0127	.0143*
	(.0021)	(.0062)	(.0177)	(.0079)
grloans(t-1)	.0331***	.0302	.0685	.0653*
	(.0075)	(.0291)	(.1017)	(.0344)
obs	1151			

Notes: Robust standard error in parenthesis.

Table 2. 12 Impulse Responses of Growth of Loans and Deposits to Monetary Policy

		Domestic private banks			Foreign banks		
	year		[5%	95%]		[5%	95%]
Loans	0	-2.9343	-4.5094	-1.4775	-1.0435	-2.8077	0.8216
	1	-6.2240	-7.5882	-4.7823	-4.7305	-6.7315	-2.9183
	2	-1.0182	-1.7240	-0.4010	-0.9137	-1.4446	-0.4876
	3	-0.0506	-0.2495	0.0619	-0.0940	-0.2064	-0.0186
	4	0.0144	-0.0219	0.0345	-0.0008	-0.0195	0.0152
	5	0.0038	-0.0008	0.0094	0.0017	-0.0010	0.0053
	6	0.0004	-0.0003	0.0018	0.0004	-0.0000	0.0012
Deposits	0	-2.5207	-4.0000	-1.0346	-1.1104	-3.0793	0.9328
	1	-2.4423	-4.0683	-0.6533	-2.0862	-3.5130	-0.4861
	2	-0.5769	-1.0601	-0.1498	-0.3596	-0.6539	-0.0902
	3	-0.0385	-0.1515	0.0243	-0.0356	-0.0901	0.0089
	4	0.0056	-0.0142	0.0148	0.0001	-0.0087	0.0080
	5	0.0019	-0.0005	0.0047	0.0007	-0.0005	0.0022
	6	0.0002	-0.0001	0.0010	0.0002	-0.0000	0.0005

Table 2. 13 Distribution of Foreign Banks by Home Country

Home Country	Number of Banks from the Home Country			
	ALL	ECE	LA	ASIA
U.S.	89 (462)	17 (73)	56 (305)	16 (84)
Germany	60 (284)	41 (183)	14 (80)	5 (21)
France	43 (191)	20 (96)	15 (68)	8 (27)
Netherland	43 (191)	9 (44)	25 (107)	9 (40)
Spain	35 (169)	0 (0)	34 (164)	1 (5)
U.K.	34 (146)	3 (6)	17 (88)	14 (52)
Austria	33 (147)	33 (147)	0 (0)	0 (0)
Italy	32 (143)	19 (67)	13 (76)	0 (0)
Japan	22 (108)	3 (5)	7 (41)	12 (62)
Singapore	17 (85)	0 (0)	0 (0)	17 (85)
Brazil	15 (78)	0 (0)	15 (78)	0 (0)
Greek	12 (45)	12 (45)	0 (0)	0 (0)
Sweden	10 (41)	9 (39)	1 (2)	0 (0)
Argentina	9 (45)	0 (0)	9 (45)	0 (0)
Belgium	9 (46)	8 (38)	0 (0)	1 (8)
Russia	9 (35)	9 (35)	0 (0)	0 (0)
China	8 (47)	0 (0)	0 (0)	8 (47)
Canada	7 (43)	0 (0)	4 (20)	3 (23)
Korea	7 (36)	4 (21)	0 (0)	3 (15)
Malaysia	7 (29)	0 (0)	0 (0)	7 (29)
Portugal	5 (18)	1 (4)	4 (14)	0 (0)
Turkey	4 (12)	4 (12)	0 (0)	0 (0)
Uruguay	4 (18)	0 (0)	4 (18)	0 (0)
Australia	3 (14)	0 (0)	0 (0)	3 (14)
Ireland	3 (16)	3 (16)	0 (0)	0 (0)
Others	55 (263)	22 (81)	22 (108)	11 (74)
Total	549 (2712)	202 (912)	233 (1214)	114 (586)

Note: Inside parenthesis is the number of observations. ECE represents “Eastern & Central Europe”, LA “Latin America”, and ASIA “Asia”.

Table 2. 14 Effects of Monetary Policy with Home Country Conditions

Dependent Variable: gr(loans)

(All)

	(1)	(2)	(3)	(4)	(5)
gr(loans)_1	.1943*** (.0261)	.1573*** (.0265)	.1935*** (.0262)	.1576*** (.0267)	.1458*** (.0272)
gr(loans)_2	.0448* (.0260)	.0256 (.0281)	.0469* (.0263)	.0268 (.0284)	.0199 (.0282)
Δmp	-.5326*** (.1556)	-.5600*** (.1643)	-.8577* (.4644)	-.8989* (.4785)	-.7975* (.4827)
Δmp_1	-.7332*** (.1390)	-.7751*** (.1479)	-.9366** (.4227)	-1.1200** (.4605)	-1.0930** (.4661)
foreign*Δmp	.4159** (.1947)	.3561* (.1950)	.4707** (.2385)	.3947* (.2344)	.3774 (.2384)
foreign*Δmp_1	.2148 (.1867)	.0947 (.1988)	.2056 (.2093)	.1154 (.2153)	.1033 (.2183)
foreign * homeΔmp	.0508 (.1993)	.1141 (.1950)	-.0271 (.2519)	.0271 (.2521)	.0306 (.2606)
foreign * homeΔmp_1	.3450 (.2472)	.4269* (.2399)	.3514 (.2427)	.4253* (.2367)	.4502* (.2480)
foreign * home gr(gdp)	.0514 (.3032)	.2353 (.3063)	.0616 (.3041)	.2445 (.3075)	-.1088 (.4962)
foreign * home inflation	.0737 (.3548)	.1740 (.3367)	.0576 (.3542)	.1454 (.3407)	-.0792 (.5414)
host macro variables	Yes	Yes	Yes	Yes	Yes
bank characteristic variables	Yes	Yes	Yes	Yes	Yes
bank characteristic variables * host monetary policy	No	No	Yes	Yes	Yes
home country effect	No	No	No	No	Yes
host country effect	No	Yes	No	Yes	Yes
year effect	No	Yes	No	Yes	Yes
Obs (num of banks)	2945 (903)	2945 (903)	2945 (903)	2945 (903)	2945 (903)
R^2	0.1363	0.1688	0.1396	0.1711	0.1942

Table 2. 15 Distribution of Foreign Banks by Entry Mode

Entry Mode	Number of Banks			
	ALL	ECE	LA	ASIA
Greenfield	306 (1598)	87 (434)	143 (759)	76 (405)
Takeover	243 (1114)	115 (478)	90 (455)	38 (181)

Note: Inside parenthesis is the number of observations. ECE represents “Eastern & Central Europe”, LA “Latin America”, and ASIA “Asia”.

Table 2. 16 Descriptive Statistics: Greenfield Foreign Banks vs. Takeover Foreign Banks

	Greenfield Established						Takeover Established					
	obs	Mean	Std.dev.	Median	Min	Max	obs	Mean	Std.dev.	Median	Min	Max
						OVERALL						
Loans/Total Assets	1598	47.98	24.11	47.18	0	99.98	1114	49.28	18.97	50.42	0	96.06
Liquid Assets/ Total Assets	1596	38.64	21.96	37.41	0	98.32	1114	35.31	18.88	32.21	0.34	100
Total Earning Assets/ Total Assets	1598	86.08	14.04	91.10	0.20	100	1114	87.05	8.81	89.26	36.82	100
Total Non Earning Assets/ Total Assets	1598	11.43	13.02	6.44	0	98.69	1114	9.62	8.12	7.33	0	62.36
Deposit/Total Assets	1598	61.17	26.93	70.64	0	98.87	1114	71.03	19.53	77.81	0	96.08
Equity/Total Assets	1589	18.81	17.55	12.80	1.00	99.68	1114	13.73	10.95	10.76	2.35	90.34
Non Interest Expenses/Average Assets	1583	6.38	8.35	4.46	-15.82	123.53	1111	6.84	5.80	5.38	-21.25	51.66
Interest Rate of Loans	1585	21.16	38.57	10.84	0	500	1112	14.96	17.32	10.53	0.57	261.34
Interest Rate of Deposits	1576	19.41	40.54	7.86	0	461.31	1109	12.13	25.38	6.31	0.52	330.35
Interest Rate Spread	1576	1.81	22.93	2.60	-368.13	260	1109	2.80	17.51	3.52	-307.95	71.62
Growth Rate of Total Assets	1285	11.24	38.84	6.74	-87.09	195.49	989	10.46	29.84	7.29	-92.25	195.51
Growth Rate of Loans	1279	13.11	54.97	4.38	-100	298.85	987	12.99	40.76	8.52	-100	244.92
Growth Rate of Deposits	1279	12.87	53.09	6.90	-100	281.48	988	12.62	40.93	6.77	-100	295.97
Growth Rate of Loan Interest Rate	1273	16.71	87.89	-3.24	-97.98	1148.99	986	1.24	49.91	-8.41	-96.85	449.17
Growth Rate of Deposit Interest Rate	1260	30.53	197.03	-4.23	-100	5590.63	982	9.94	108.11	-12.52	-88.09	1494.67
Net Interest Margin	1585	5.91	6.83	4.19	-8.3	127.34	1112	6.06	5.68	4.68	-34.54	50.61
Return on Average Assets	1592	0.92	5.03	1.09	-53.1	68.6	1112	0.51	5.72	0.92	-111.13	65.62

Table 2.16 (Continued)

	Descriptive Statistics: t-test		
Variable	Greenfield ≠ Takeover	Greenfield < Takeover	Greenfield > Takeover
Loans/Total Assets	0.1319	0.0660	0.9340
Liquid Assets/ Total Assets	0.0000	1.0000	0.0000
Total Earning Assets/ Total Assets	0.0411	0.0206	0.9794
Total Non Earning Assets/ Total Assets	0.0000	1.0000	0.0000
Deposit/Total Assets	0.0000	0.0000	1.0000
Equity/Total Assets	0.0000	1.0000	0.0000
Non Interest Expenses/Average Assets	0.1098	0.0549	0.9451
Interest Rate of Loans	0.0000	1.0000	0.0000
Interest Rate of Deposits	0.0000	1.0000	0.0000
Interest Rate Spread	0.2260	0.1130	0.8870
Growth Rate of Total Assets	0.5982	0.7009	0.2991
Growth Rate of Loans	0.9539	0.5231	0.4769
Growth Rate of Deposits	0.9011	0.5494	0.4506
Growth Rate of Loan Interest Rate	0.0000	1.0000	0.0000
Growth Rate of Deposit Interest Rate	0.0033	0.9984	0.0016
Net Interest Margin	0.5515	0.2758	0.7242
Return on Average Assets	0.0484	0.9758	0.0242

Notes: Greenfield≠ Takeover: p-value of two-sided t-test on equality of mean. H1: μ(greenfield foreign banks) ≠ μ(takeover foreign banks).

Greenfield < (>) Takeover: p-value of one-sided t-test on equality of mean. H1: μ(greenfield foreign banks) < (>) μ(takeover foreign banks).

Table 2. 17 Effects of Monetary Policy with Entry Mode

Dependent Variable: gr(loans)

(All)

	(1)	(2)	(3)	(4)	(5)
gr(loans)_1	.1847*** (.0258)	.1952*** (.0259)	.1609*** (.0262)	.1941*** (.0260)	.1609*** (.0265)
gr(loans)_2	.0436* (.0264)	.0466* (.0258)	.0289 (.0278)	.0483* (.0261)	.0294 (.0281)
Δmp	-.5840*** (.1563)	-.5217*** (.1548)	-.5478*** (.1630)	-.9027** (.4345)	-.9675** (.4483)
Δmp_1	-.7809*** (.1411)	-.7262*** (.1388)	-.7583*** (.1472)	-.9814** (.3983)	-1.1878*** (.4384)
greenfield	-5.5358*** (2.0223)	-7.7241*** (2.1125)	-6.8108*** (2.2964)	-7.9977*** (2.1340)	-7.0795*** (2.2728)
takeover	1.1424 (1.7681)	.5375 (1.7639)	.3865 (1.7976)	.5176 (1.7946)	.4573 (1.8237)
greenfield *Δmp	.3959 (.2455)	.3399 (.2426)	.2599 (.2380)	.3727 (.2677)	.2677 (.2591)
greenfield *Δmp_1	.1178 (.2406)	.1388 (.2441)	-.0565 (.2513)	.1176 (.2590)	-.0492 (.2572)
takeover *Δmp	.5839*** (.2196)	.5433** (.2129)	.4796** (.2153)	.6173** (.2456)	.5515** (.2435)
takeover *Δmp_1	.5568*** (.1950)	.5885*** (.1924)	.5635*** (.2104)	.6071*** (.1977)	.6006*** (.2130)
host macro variables	Yes	Yes	Yes	Yes	Yes
bank characteristic variables	No	Yes	Yes	Yes	Yes
bank characteristic variables * host monetary policy	No	No	No	Yes	Yes
host country effect	No	No	Yes	No	Yes
year effect	No	No	Yes	No	Yes
Obs (num of banks)	3024 (905)	3006 (904)	3006 (904)	3006 (904)	3006 (904)
R^2	0.1197	0.1388	0.1698	0.1424	0.1728

Table 2. 18 Foreign Bank Penetration Level, Credit and Monetary Policy

Dependent variable:	gr (loans)				
	(1)	(2)	(3)	(4)	(5)
gr(loans)_1	.1749 (.1463)	.2502	.1864 (.0911)**	.1892 (.0870)**	.1929 (.0909)**
Δmp	-2.5305 (1.2403)	-4.0258	-3.0139	-3.7685	-3.8190 (1.6755)**
Δmp_1	-2.0763 (1.1619)	-1.7618	-.9769 (.8890)	-2.2964 (1.5577)	-2.3375 (1.5685)
peneta	.0895 (.1126)	.0249 (.0906)	.0333 (.0971)	.0181 (.0969)	.0243 (.0975)
peneta*Δmp	.0278 (.0126) **	.0388	.0422	.0420	.0424 (.0139)***
peneta*Δmp_1	-.0007 (.0098)	-.0047 (.0074)	.0001 (.0083)	-.0000 (.0080)	-.0000 (.0080)
sbsta	-.0020 (.1259)	-.0163 (.1184)	-.0272 (.1179)	-.0430 (.1183)	-.0375 (.1202)
sbsta *Δmp	.0158 (.0091) *	.0334 (.0159)**	.0310 (.0164)*	.0279 (.0168)	.0288 (.0179)
sbsta * Δmp_1	-.0057 (.0058)	-.0033 (.0104)	-.0007 (.0108)	-.0025 (.0097)	-.0024 (.0098)
concenta	.0226 (.1047)	-.1124 (.1047)	-.1376 (.1006)	-.1424 (.1051)	-.1348 (.1158)
concenta*Δmp	.0176 (.0155)	-.0114 (.0179)	-.0058 (.0189)	-.0019 (.0182)	-.0023 (.0185)
concenta*Δmp_1	.0305 (.0150) **	.0103 (.0187)	.0058 (.0184)	.0099 (.0178)	.0105 (.0178)
lqta_1		.2636 (.1270)**	.2221 (.1362)	.1975 (.1320)	.1953 (.1346)
lqta_1 * Δmp		-.0227 (.0145)	-.0550 (.0238)**	-.0536 (.0229)**	-.0537 (.0234)**
lqta_1 * Δmp_1		.0048 (.0139)	-.0077 (.0142)	-.0037 (.0153)	-.0037 (.0156)
equityta_1		1.7883	1.9240	1.8877	1.8885 (.4628)***
equityta_1* Δmp		.2732 (.1025)**	.2601	.2736	.2755 (.0935)**
equityta_1 *Δmp_1		.0662 (.0510)	.0799 (.0485)	.1102 (.0521)**	.1100 (.0522)**
niraaall_1		-1.7455	-1.3830 (.7371)*	-1.6768 (.8545)*	-1.6123 (.8416)*
niraaall_1*Δmp		-.1224 (.0798)	-.1560 (.0896)*	-.1525 (.0916)	-.1506 (.0914)
niraaall_1*Δmp_1		-.0171 (.0756)	-.0684 (.0854)	-.0486 (.0905)	-.0488 (.0917)
niraadom_1					
niraadom_1*Δmp					
niraadom_1*Δmp_1					
nieaaall_1					
nieaaall_1*Δmp					
nieaaall_1*Δmp_1					
nieaadom_1					
nieaadom_1*Δmp					
nieaadom_1*Δmp_1					
domcredit				-.0222 (.0407)	-.0233 (.0419)
domcredit*Δmp				.0102 (.0085)	.0103 (.0086)
domcredit*Δmp_1				.0142 (.0102)	.0142 (.0103)
crrgdp_1			.4007 (.4045)	.2314 (.4265)	.2294 (.4295)
peneta*crrgdp_1			.0027 (.0083)	.0053 (.0091)	.0051 (.0093)
inflation_1			-.0339 (.1215)	-.0367 (.1252)	-.0324 (.1250)
peneta* inflation_1			-.0041 (.0070)	-.0050 (.0072)	-.0051 (.0073)
llploans_1			-.6121	-.6476	-.6607 (.1973)***
peneta*llploans_1			-.0076 (.0072)	-.0082 (.0075)	-.0080 (.0075)
crisis					1.1574(4.5194)
obs	182 (35)	182 (35)	182 (35)	182 (35)	182 (35)
R^2	0.1920	0.3737	0.4309	0.4435	0.4440

Table 2.18 (Continued)

Dependent variable:	gr (loans)				
	(6)	(7)	(8)	(9)	(10)
gr(loans)_1	.1227 (.0794)	.1624 (.0725)**	.1196 (.0863)	.1684 (.0763)**	.1528 (.0736)**
Δmp	-2.8989	-1.9495 (1.5980)	-3.5281	-3.3028	-2.8079 (1.6707)*
Δmp_1	-2.2606 (1.3727)	-1.6084 (1.1015)	-2.7151	-2.2953	-2.2279 (1.2658)*
peneta	.0332 (.0954)	.0115 (.1019)	.0538 (.0954)	.0608 (.0989)	.0538 (.0897)
peneta*Δmp	.0432	.0373 (.0145)**	.0412	.0378	.0425 (.0133)***
peneta*Δmp_1	.0020 (.0074)	-.0047 (.0070)	.0038 (.0079)	-.0015 (.0079)	.0002 (.0066)
sbsta	-.0371 (.1120)	-.0657 (.1108)	-.0190 (.1239)	.0053 (.1204)	-.0396 (.1112)
sbsta *Δmp	.0282 (.0168)*	.0292 (.0175)	.0291 (.0151)*	.0376 (.0159)**	.0296 (.0168)*
sbsta * Δmp_1	.0009 (.0094)	-.0058 (.0108)	.0045 (.0089)	.0036 (.0105)	-.0004 (.0095)
concenta	-.2547 (.1057)**	-.2657 (.1024)**	-.2765	-.2634	-.2396 (.1074)**
concenta*Δmp	-.0131 (.0186)	-.0201 (.0191)	-.0129 (.0178)	-.0222 (.0177)	-.0155 (.0182)
concenta*Δmp_1	.0106 (.0157)	.0168 (.0180)	.0131 (.0179)	.0161 (.0222)	.0118 (.0158)
lqta_1	.1639 (.1332)	.1112 (.1324)	.1698 (.1310)	.1403 (.1362)	.1410 (.1316)
lqta_1 * Δmp	-.0550 (.0221)**	-.0716	-.0385 (.0188)**	-.0514 (.0203)**	-.0560 (.0227)**
lqta_1 * Δmp_1	-.0091 (.0138)	-.0159 (.0121)	-.0001 (.0084)	-.0039 (.0090)	-.0106 (.0134)
equityta_1	1.9722	1.9830	1.6987	1.5840	1.9764 (.4984)***
equityta_1* Δmp	.2907	.3293	.2103	.2500	.2954 (.0824)***
equityta_1 *Δmp_1	.1186 (.0482)**	.1364	.0783 (.0506)	.0722 (.0564)	.1254 (.0464)**
niraaall_1	-1.8217 (.9258)*				-1.8585 (.9362)*
niraaall_1*Δmp	-.1923 (.0920)**				-.1925 (.0931)**
niraaall_1*Δmp_1	-.0803 (.0852)				-.0944 (.0796)
niraadom_1		-1.8819			
niraadom_1*Δmp		-.2510			
niraadom_1*Δmp_1		-.1604 (.0799)*			
nieaaall_1			-1.4137		
nieaaall_1*Δmp			-.0191 (.0410)		
nieaaall_1*Δmp_1			-.0098 (.0384)		
nieaadom_1				-.6741	
nieaadom_1*Δmp				-.0208 (.0518)	
nieaadom_1*Δmp_1				-.0282 (.0514)	
domcredit	-.0027 (.0432)	-.0240 (.0401)	-.0254 (.0452)	-.0037 (.0395)	-.0035 (.0428)
domcredit*Δmp	.0061 (.0099)	.0000 (.0090)	.0083 (.0088)	.0079 (.0098)	.0059 (.0087)
domcredit*Δmp_1	.0134 (.0100)	.0071 (.0101)	.0106 (.0085)	.0107 (.0084)	.0140 (.0098)
crrgdp_1	.0595 (.4931)	.0761 (.5286)	.1427 (.4846)	.1493 (.5428)	
peneta*crrgdp_1	.0077 (.0101)	.0075 (.0123)	.0048 (.0093)	.0047 (.0115)	
inflation_1	-.0356 (.1240)	-.0304 (.1271)	.0092 (.1059)	-.0052 (.1166)	-.0241 (.1249)
peneta* inflation_1	-.0050 (.0074)	-.0070 (.0075)	-.0065 (.0062)	-.0065 (.0066)	-.0057 (.0074)
llploans_1	-.5628	-.6039	-.4330	-.5630	-.5722 (.1599)***
peneta*llploans_1	-.0074 (.0074)	-.0070 (.0069)	-.0007 (.0046)	-.0019 (.0044)	-.0073 (.0077)
argcrisis	-7.0989	-8.7383(2.5405)	-6.8323	-8.1173(2.6953)	-7.6547(2.6235)**
asiacrisis	-11.5236	-10.2366	-8.8716 (6.9588)	-8.9852 (6.8360)	-12.8935(5.6015)*
ruscrisis	13.144(4.4029)*	12.288(4.3290)*	14.971(4.7542)*	12.880(4.2237)*	11.967(4.4355)***
bracrisis	1.9302 (3.4172)	3.1955 (3.3134)	1.7069 (3.1031)	1.1295 (3.1273)	.8512(3.3918)
obs	182 (35)	179 (34)	182 (35)	179 (34)	182 (35)
R^2	0.4760	0.4987	0.4907	0.5007	0.4700

Table 2.18 (Continued)

Dependent variable:	gr (loans)				
	(11)	(12)	(13)	(14)	(15)
gr(loans)_1	.1278 (.0783)	.1256 (.0847)	.0857 (.0826)	.1254 (.0826)	.0976 (.0869)
Δmp	-2.8663	-3.7190	-1.9917 (1.6441)	-4.1770(1.4521)	-3.8609
Δmp_1	-1.8399 (1.1995)	-2.3940	-1.6751 (1.1760)	-1.7568 (1.5194)	-3.6038 (1.4573)**
peneta	*.0723 (.0910)*	*.0985 (.0945)*	*.0330 (.0981)*	.0078 (.0910)	.0429 (.1082)
peneta*Δmp	*.0442*	*.0427*	*.0401*	.0395	.0428 (.0138)***
peneta*Δmp_1	*.0032 (.0070)*	*.0063 (.0070)*	*.0020 (.0090)*	.0036 (.0077)	.0026 (.0103)
sbsta	-.0373 (.1032)	-.0136 (.1170)	-.0116 (.1197)	-.0252 (.1089)	-.0539 (.1131)
sbsta * Δmp	.0259 (.0148)*	.0291 (.0138)**	.0243 (.0187)	.0328 (.0168)*	.0342 (.0174)*
sbsta * Δmp_1	.0049 (.0100)	.0087 (.0094)	.0020 (.0120)	.0088 (.0085)	.0011 (.0104)
concenta	-.2684	-.3050	-.3018 (.1634)*	-.2467 (.1048)**	-.2562 (.1047)**
concenta*Δmp	-.0105 (.0182)	-.0123 (.0177)	-.0176 (.0204)	-.0124 (.0192)	-.0135 (.0192)
concenta*Δmp_1	-.0010 (.0124)	-.0008 (.0125)	.0043 (.0138)	.0016 (.0167)	.0193 (.0242)
lqta_1	.1219 (.1281)	.1203 (.1239)	.1379 (.1531)	.1877 (.1366)	.1919 (.1272)
lqta_1 * Δmp	-.0590	-.0418 (.0172)**	-.0367 (.0251)	-.0413 (.0198)**	-.0383 (.0208)*
lqta_1 * Δmp_1	-.0076 (.0134)	.0025 (.0092)	-.0110 (.0140)	-.0099 (.0085)	-.0019 (.0101)
equityta_1	1.9803	1.7395	1.9943	2.1896	2.0884 (.4824)***
equityta_1*Δmp	.2951	.2162	.2378 (.0933)**	.2451	.2274 (.0903)**
equityta_1 *Δmp_1	.1191	.0845 (.0467)*	.1130 (.0624)*	.1039 (.0503)**	.0687 (.0779)
niraaall_1	-1.8205 (.9040)*		-1.8661 (1.1664)	*-1.1281 (.6053)**	
niraaall_1*Δmp	-.1972 (.0863)**		-.1724 (.1059)	*-.0141 (.0599)*	
niraaall_1*Δmp_1	-.0697 (.0869)		-.0751 (.0773)	*-.0449 (.0456)*	
niraadom_1					
niraadom_1*Δmp					
niraadom_1*Δmp_1					
nieaaall_1		-1.4258			*-1.8501 (.6524)****
nieaaall_1*Δmp		-.0024 (.0426)			*-.0359 (.0648)*
nieaaall_1*Δmp_1		.0055 (.0442)			*.0655 (.1102)*
domcredit	-.0066 (.0411)	-.0309 (.0434)	.0010 (.0518)	.0127 (.0423)	-.0138 (.0521)
domcredit*Δmp	.0048 (.0098)	.0070 (.0089)	.0014 (.0102)	.0150 (.0097)	.0140 (.0085)
domcredit*Δmp_1	.0135 (.0095)	.0105 (.0082)	.0110 (.0112)	.0097 (.0105)	.0176 (.0089)*
crrgdp_1	.1679 (.4942)	.2656 (.4735)	-.1019 (.5619)	-.0591 (.4934)	-.1515 (.4699)
peneta*crrgdp_1	.0054 (.0098)	.0024 (.0090)	.0090 (.0119)	.0074 (.0105)	.0058 (.0106)
inflation_1	.0059 (.1382)	.0667 (.1136)	-.0242 (.1506)	-.0604 (.1197)	-.0208 (.1176)
peneta* inflation_1	-.0072 (.0082)	-.0093 (.0070)	-.0026 (.0084)	-.0030 (.0072)	-.0047 (.0068)
llploans_1	-.5916	-.4655	-.5415 (.2140)**	-.5787	-.5689 (.2077)***
peneta*llploans_1	-.0077 (.0078)	-.0006 (.0049)	-.0059 (.0145)	-.0078 (.0070)	-.0084 (.0060)
argcrisis	-6.9036(2.7334)	-6.6639(2.8308)	-8.1415(3.9870)	-6.9294(3.1113)	-6.5303(2.7055)**
asiacrisis	-11.8829(6.1885	-9.1687 (6.6999)	-13.1144	-11.8067(6.8572	-11.3718 (7.2904)
ruscrisis	13.9387(4.6379)	15.955(4.9392)*	12.819(4.0674)*	10.978(4.6376)*	12.834(4.3696)***
bracrisis	1.9093(3.4099)	1.8819(3.1452)	1.2307 (4.1105)	2.4189 (3.4185)	.7524 (3.1506)
obs	182 (35)	182 (35)	148 (35)	182 (35)	180 (35)
R^2	0.4801	0.4974	0.5029	0.4967	0.5098

Notes: In specification (11) and (12), the penetration level, state bank's market share and concentration level are measured in loans. In (13), the penetration series is from Micco et al (2004). In (14) and (15), niraaall_1 and nieaaall_1 are respectively replaced by the data from Beck et al (2000), nirteabeck_1 and octabeck_1.

Table 3. 1 Descriptive Statistics

	obs	Mean	Standard Deviation	Median	Min	Max
Growth rate of real GDP per capita	69	2.503	3.3282	2.3117	-5.4804	10.3432
Growth rate of fixed capital formation	67	4.3027	10.1696	3.8656	-22.6970	39.2716
Growth rate of employed labor	67	.9758	2.4748	.9090	-5.0504	14.0466
Inflation	67	9.9840	12.6025	7.0794	-2.7519	75.1725
Depreciation	67	10.5903	16.3928	6.3772	-8.4507	84.1147
Domestic credit / GDP	69	54.9675	41.1922	46.186	13.4752	207.3569
Stock market turnover rate	65	56.282	92.9597	29.5534	.6308	492.9437
Net interest revenue/average assets (all banks)	69	4.7078	2.7112	4.1801	-1.0504	14.4795
Net interest revenue/average assets (domestic banks only)	68	4.6892	2.9847	4.4549	-2.5953	14.7016
Non-interest expenses/average assets (all banks)	69	6.9293	4.0045	5.7178	1.0165	21.4147
Non-interest expenses/average assets (domestic banks only)	68	7.6266	5.5096	6.6671	1.0783	37.5532
Concentration level	69	56.3631	15.7974	52.765	32.2775	97.875
Penetration Level (in terms of total assets)	69	36.9159	29.2143	34.1425	0	100
Penetration Level (in terms of loans)	69	37.5554	30.1087	34.48	0	100
State-owned banks market share	69	21.7094	22.0364	13.5837	0	91.2425

Table 3. 2 Correlation

	Growth rate of GDP per capita	Growth rate of fixed capital formation	Growth rate of labor	Inflation	Depreciation	Domestic credit / GDP	Stock market turnover rate	Net interest revenue / average assets	Foreign bank penetration level	State-owned banks share
Growth rate of GDP per capita	1.0000									
Growth rate of fixed capital formation	0.7087***	1.0000								
Growth rate of labor	-0.1494	-0.0046	1.0000							
Inflation	-0.0861	0.0336	-0.2246*	1.0000						
Depreciation	-0.2011*	-0.1412	-0.2185	0.9153***	1.0000					
Domestic credit / GDP	-0.1521	-0.3153***	0.1753	-0.1868	-0.1363	1.0000				
Stock market turnover rate	0.0428	-0.0578	-0.0928	-0.1170	-0.1014	0.0450	1.0000			
Net interest revenue / average assets	-0.2248*	0.1025	-0.0482	0.2051*	0.2322*	-0.5045***	-0.0965	1.0000		
Foreign bank penetration level	0.0515	0.0090	-0.0173	-0.2066*	-0.2818**	-0.0633	-0.0904	-0.0325	1.0000	
State-owned banks share	-0.0010	0.0061	-0.1917	0.2368*	0.2215*	0.0558	0.1238	-0.3240***	-0.5403***	1.0000

Notes: *** represents 1% significance level, ** 5% significance level and * 10% significance level.

Table 3. 3 Foreign Bank Penetration and Resource Allocation

Dependent variable: $gr(\ GDP\ per\ capita)_{i,t}$

	Pooled OLS	Fixed-effect Estimation
	(1)	(2)
$gr(fixed\ capital)_{i,t}$	.2439***	.1659**
	(.0331)	(.0739)
$gr(labor)_{i,t}$	-.1520	-.9442***
	(.2166)	(.3357)
$inidevelopment_i$	-.2685*	
	(.1417)	
$inflation_{i,t}$	-.0198	-.0883
	(.0345)	(.0922)
$depreciation_{i,t}$	-.0758***	-.0362
	(.0224)	(.0322)
$domcredit_{i,t}$	-.0049	-.0337
	(.0047)	(.0351)
$stturnover_{i,t}$	-.0009	.0247*
	(.0018)	(.0141)
$niraaall_{i,t}$	-.3095**	-.6546***
	(.1268)	(.2073)
$peneta_{i,t}$	-.0109	-.0142
	(.0106)	(.0260)
$sbsta_{i,t}$	-.0076	-.0024
	(.0168)	(.0511)
$peneta_{i,t} * gr(fixed\ capital)_{i,t}$	.0010**	.0020*
	(.0004)	(.0011)
$peneta_{i,t} * gr(labor)_{i,t}$	-.0034	.0009
	(.0027)	(.0079)
$niraaall_{i,t} * gr(fixed\ capital)_{i,t}$	-.0191***	-.0129*
	(.0048)	(.0075)
$niraaall_{i,t} * gr(labor)_{i,t}$	-.0134	.2034***
	(.0399)	(.0578)
Obs	60 (32)	58 (31)
R^2	0.8107	0.3366

Notes: Robust standard deviation in parenthesis. *** represents 1% significance level, ** 5% significance level and * 10% significance level.

Table 3. 4 Robust Test I

Dependent variable: *gr(GDP per capita)*$_{i,t}$

	Pooled OLS		Fixed-effects Estimation	
	(3)	(4)	(5)	(6)
gr(fixed capital)$_{i,t}$	.2409***	.2371***	.1659**	.2202***
	(.0330)	(.0349)	(.0739)	(.0580)
gr(labor)$_{i,t}$	-.1596	-.1921	-.9442***	-.6678
	(.2169)	(.2850)	(.3357)	(.4115)
inidevelopment$_i$	-.2917**	-.5025***		
	(.1406)	(.1783)		
inflation$_{i,t}$	-.0179	-.0065	-.0883	-.0028
	(.0332)	(.0286)	(.0922)	(.0879)
depreciation$_{i,t}$	-.0748***	-.0846***	-.0362	-.0745***
	(.0212)	(.0181)	(.0322)	(.0277)
domcredit$_{i,t}$	-.0042	-.0045	-.0337	.0025
	(.0048)	(.0055)	(.0351)	(.0209)
stturnover$_{i,t}$	-.0009	.0035**	.0247*	.0122
	(.0019)	(.0016)	(.0141)	(.0114)
niraaall$_{i,t}$	-.3095**	-.3336***	-.6546***	-.8538***
	(.1332)	(.1154)	(.2073)	(.2159)
peneta$_{i,t}$	-.0082	.0000	-.0142	.0169
	(.0104)	(.0148)	(.0260)	(.0232)
sbsta$_{i,t}$	-.0056	-.0050	-.0024	.0410
	(.0175)	(.0167)	(.0511)	(.0361)
peneta$_{i,t}$ * *gr(fixed capital)*$_{i,t}$	.0011**	.0009	.0020*	.0023**
	(.0004)	(.0005)	(.0011)	(.0011)
peneta$_{i,t}$ * *gr(labor)*$_{i,t}$	-.0030	-.0005	.0009	-.0016
	(.0030)	(.0039)	(.0079)	(.0058)
niraaall$_{i,t}$ * *gr(fixed capital)*$_{i,t}$	-.0188***	-.0167***	-.0129*	-.0181**
	(.0051)	(.0047)	(.0075)	(.0073)
niraaall$_{i,t}$ * *gr(labor)*$_{i,t}$	-.0134	-.0199	.2034***	.1139**
	(.0389)	(.0408)	(.0578)	(.0510)
Obs	60 (32)	58 (31)	58 (31)	58 (31)
R^2	0.8099	0.8396	0.3366	0.5677

Notes: In specification (3) and (5), foreign bank penetration level, peneta$_{i,t}$, is measured in terms of total loans. In (4) and (6), foreign bank penetration level series is borrowed from Micco et al (2004). Robust standard deviation in parenthesis. *** represents 1% significance level, ** 5% significance level and * 10% significance level.

Table 3. 5 Robust Test II

Dependent variable: *gr(GDP per capita)*$_{i,t}$

	Pooled OLS			Fixed-effects Estimation		
	(7)	(8)	(9)	(10)	(11)	(12)
gr(fixed capital)$_{i,t}$	.1841***	.2292***	.1923***	.1349***	.1557***	.1675***
	(.0522)	(.0310)	(.0373)	(.0430)	(.0800)	(.0531)
gr(labor)$_{i,t}$	-.2808	-.1060	-.1705	-.6884***	-.4901	-.5928***
	(.2026)	(.2212)	(.2430)	(.1646)	(.3859)	(.1445)
inidevelopment$_{i}$	-.4066	-.2758*	-.3886*			
	(.2412)	(.1457)	(.2215)			
inflation$_{i,t}$	-.0439	-.0222	-.0529	-.1185*	-.0990	-.0937*
	(.0378)	(.0339)	(.0405)	(.0639)	(.0909)	(.0483)
depreciation$_{i,t}$	-.0674**	-.0768***	-.0827***	-.0054	-.0605*	-.0283
	(.0266)	(.0232)	(.0260)	(.0216)	(.0327)	(.0201)
domcredit$_{i,t}$	-.0086	-.0056	-.0047	-.0176	-.0200	-.0072
	(.0070)	(.0048)	(.0056)	(.0244)	(.0371)	(.0234)
stturnover$_{i,t}$	-.0007	-.0010	-.0015	.0043	.0128	-.0003
	(.0020)	(.0019)	(.0022)	(.0101)	(.0143)	(.0088)
competition$_{i,t}$	-.2804***	-.2870**	-.1355	-.3881**	-.5215**	-.3945***
	(.1383)	(.1187)	(.1001)	(.1579)	(.1962)	(.0801)
peneta$_{i,t}$	-.0109	-.0081	-.0005	.0089	-.0257	.0187
	(.0130)	(.0113)	(.0137)	(.0244)	(.0298)	(.0223)
sbsta$_{i,t}$	-.0043	-.0076	.0065	.0278	-.0080	.0465
	(.0204)	(.0168)	(.0191)	(.0422)	(.0572)	(.0423)
peneta$_{i,t}$ * *gr(fixed capital)*$_{i,t}$	.0004	.0009**	.0000	.0002	.0022*	-.0004
	(.0007)	(.0004)	(.0009)	(.0008)	(.0012)	(.0009)
peneta$_{i,t}$ * *gr(labor)*$_{i,t}$	-.0057	-.0043	-.0067	.0004	-.0044	-.0024
	(.0046)	(.0030)	(.0059)	(.0062)	(.0083)	(.0052)
competition$_{i,t}$ * *gr(fixed capital)*$_{i,t}$	-.0050	-.0163***	-.0050	.0006	-.0144**	-.0034
	(.0056)	(.0041)	(.0043)	(.0047)	(.0068)	(.0041)
competition$_{i,t}$ * *gr(labor)*$_{i,t}$	.0190	-.0177	.0021	.1596***	.1238*	.1403***
	(.0320)	(.0399)	(.0393)	(.0285)	(.0639)	(.0247)
Obs	59 (32)	60 (32)	58 (32)	59 (32)	60 (32)	58 (32)
R^2	0.7540	0.8086	0.7245	0.3986	0.5054	0.3197

Notes: In specification (7) and (10), the competition level of banking sector is measured by the net interest revenue over average assets for only domestic banks; in (8) and (11), measured by the non-interest expenses over average assets for all banks; in (9) and (12), measured by non-interest expenses over average assets for only domestic banks. *** represents 1% significance level, ** 5% significance level and * 10% significance level.

Table 3. 6 Robust Test III

Dependent variable: $gr(\ GDP\ per\ capita)_{i,t}$

	Pooled OLS	Fixed-effect Estimation
	(13)	(14)
$gr(fixed\ capital)_{i,t}$	.2641***	.1249
	(.0579)	(.1004)
$gr(labor)_{i,t}$	-.6042*	-1.2854**
	(.3340)	(.6161)
$inidevelopment_i$	.0359	
	(.2403)	
$inflation_{i,t}$	-.0117	-.0875
	(.0351)	(.1014)
$depreciation_{i,t}$	-.0776***	-.0435
	(.0258)	(.0337)
$credittoprivate_{i,t}$	-.0202*	-.0377
	(.0110)	(.0306)
$stturnover_{i,t}$	-.0005	.0262*
	(.0021)	(.0135)
$competition_{i,t}$	-.4092***	-.7405***
	(.1434)	(.2714)
$peneta_{i,t}$	-.0130	-.0261
	(.0099)	(.0304)
$sbsta_{i,t}$	-.0096	-.0085
	(.0163)	(.0525)
$peneta_{i,t} * gr(fixed\ capital)_{i,t}$	.0009	.0023**
	(.0005)	(.0011)
$peneta_{i,t} * gr(labor)_{i,t}$	-.0009	.0020
	(.0033)	(.0085)
$competition_{i,t} * gr(fixed\ capital)_{i,t}$	-.0197***	-.0103
	(.0067)	(.0098)
$competition_{i,t} * gr(labor)_{i,t}$	.0177	.2325***
	(.0388)	(.0661)
$credittoprivate_{i,t} * gr(fixed\ capital)_{i,t}$	-.0005	.0000
	(.0004)	(.0007)
$credittoprivate_{i,t} * gr(labor)_{i,t}$	.0061	.0045
	(.0037)	(.0067)
Obs	60 (32)	60 (32)
R^2	0.8182	0.3292

Notes: *** represents 1% significance level, ** 5% significance level and * 10% significance level.

Appendix of Figures

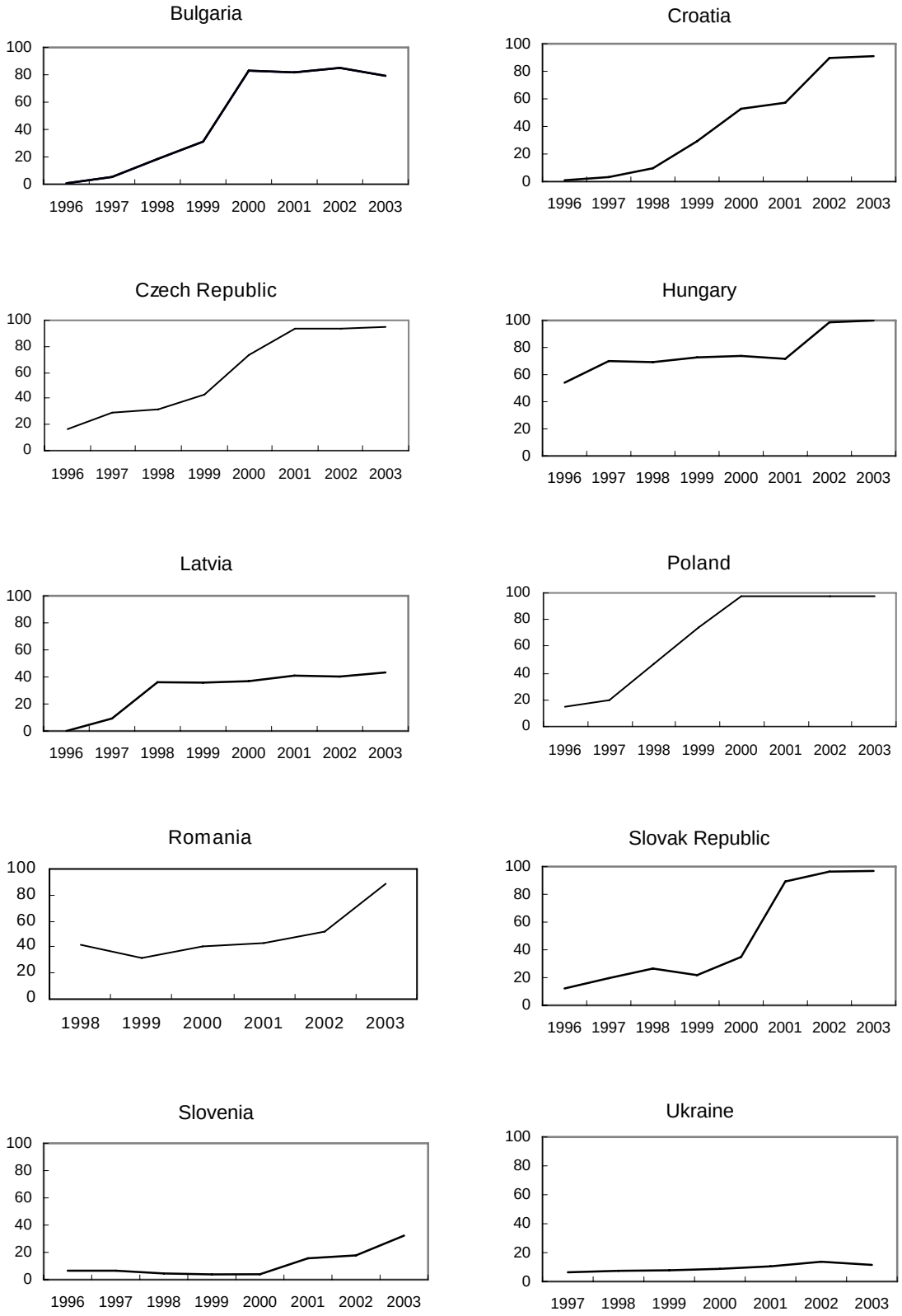


Figure 1. 1 Share of Foreign Bank Assets to Banking Sector Total Assets (Central and Eastern Europe)

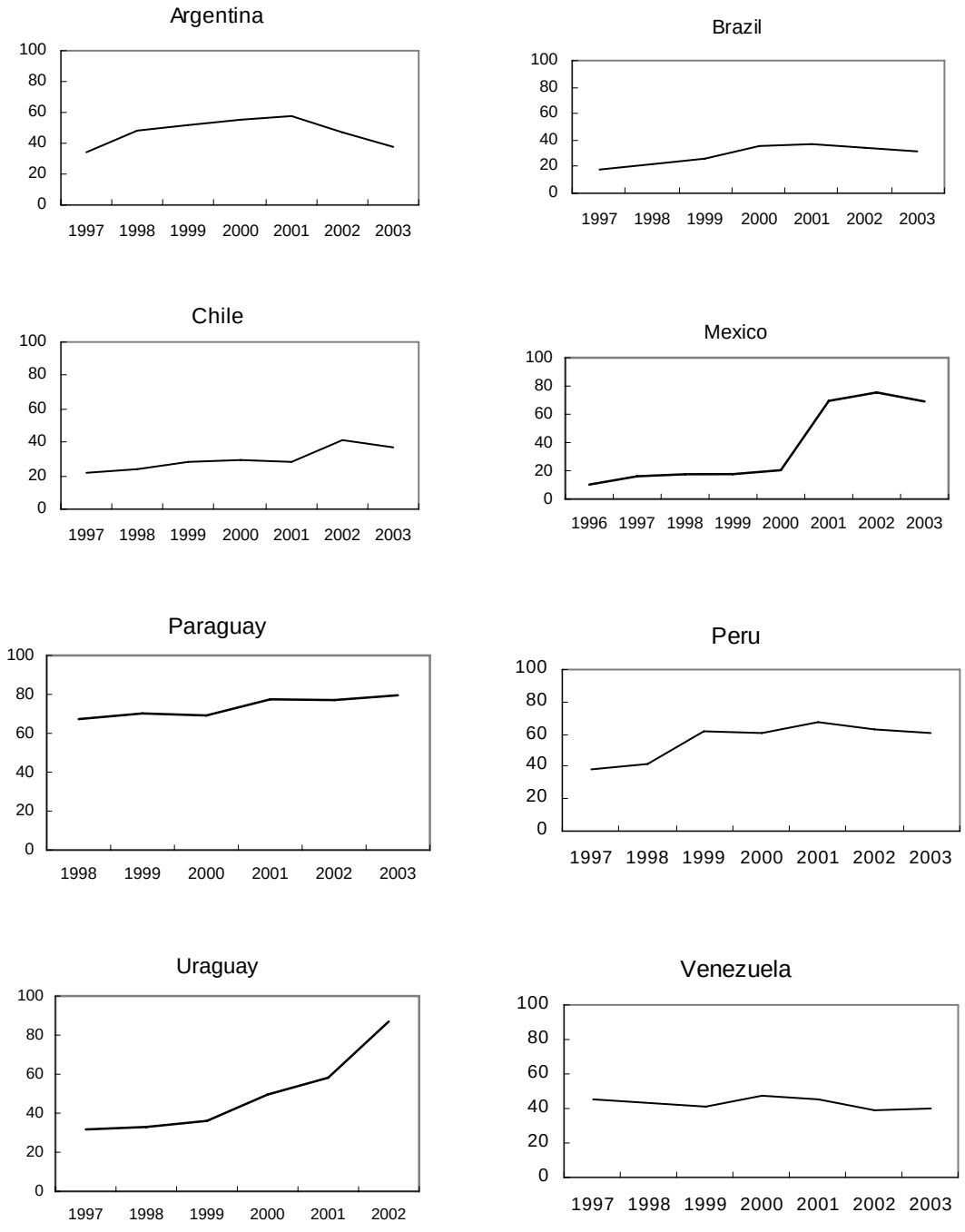


Figure 1. 2 Share of Foreign Bank Assets to Banking Sector Total Assets (Latin America)

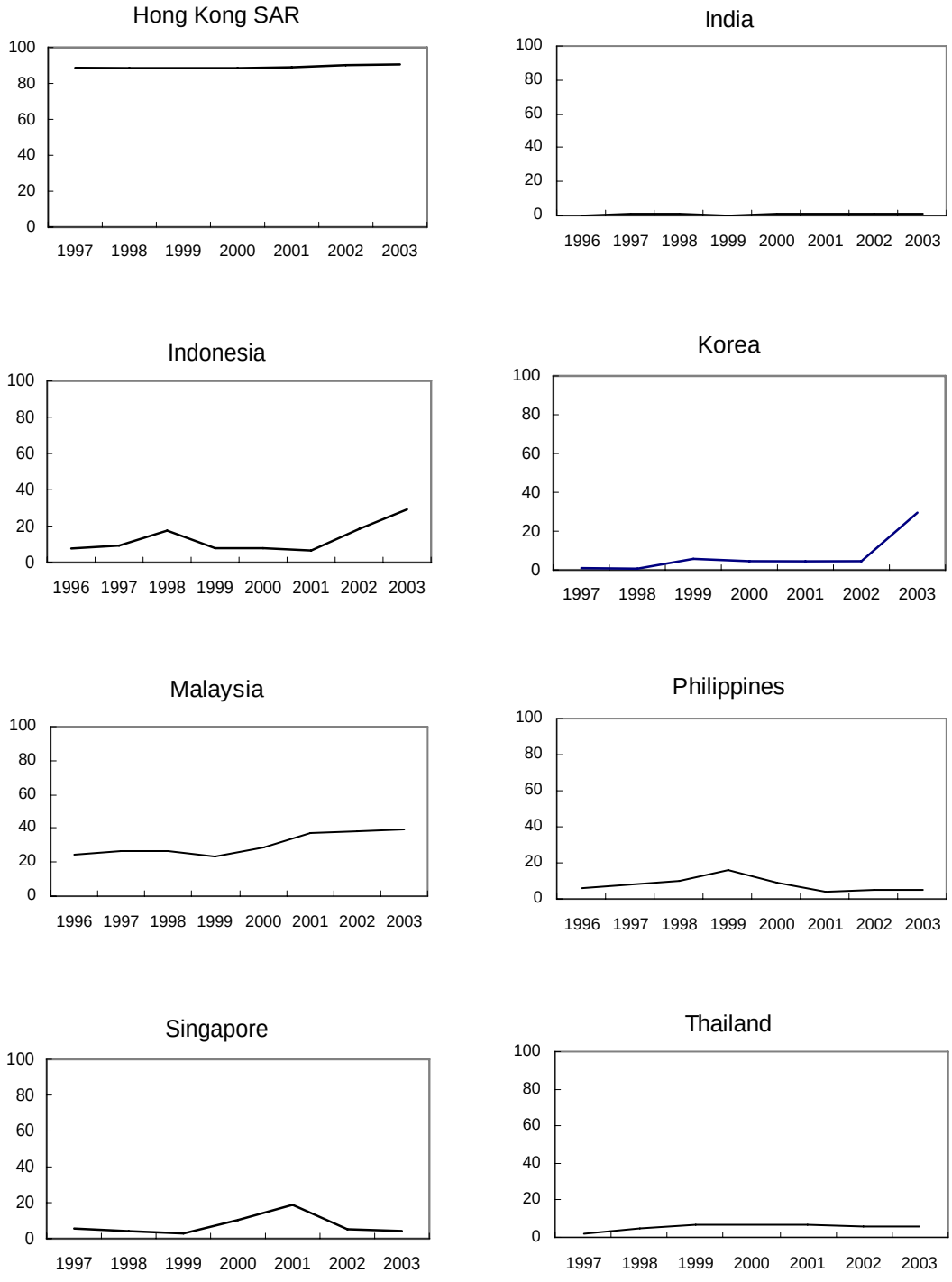


Figure 1. 3 Share of Foreign Bank Assets to Banking Sector Total Assets (Asia)

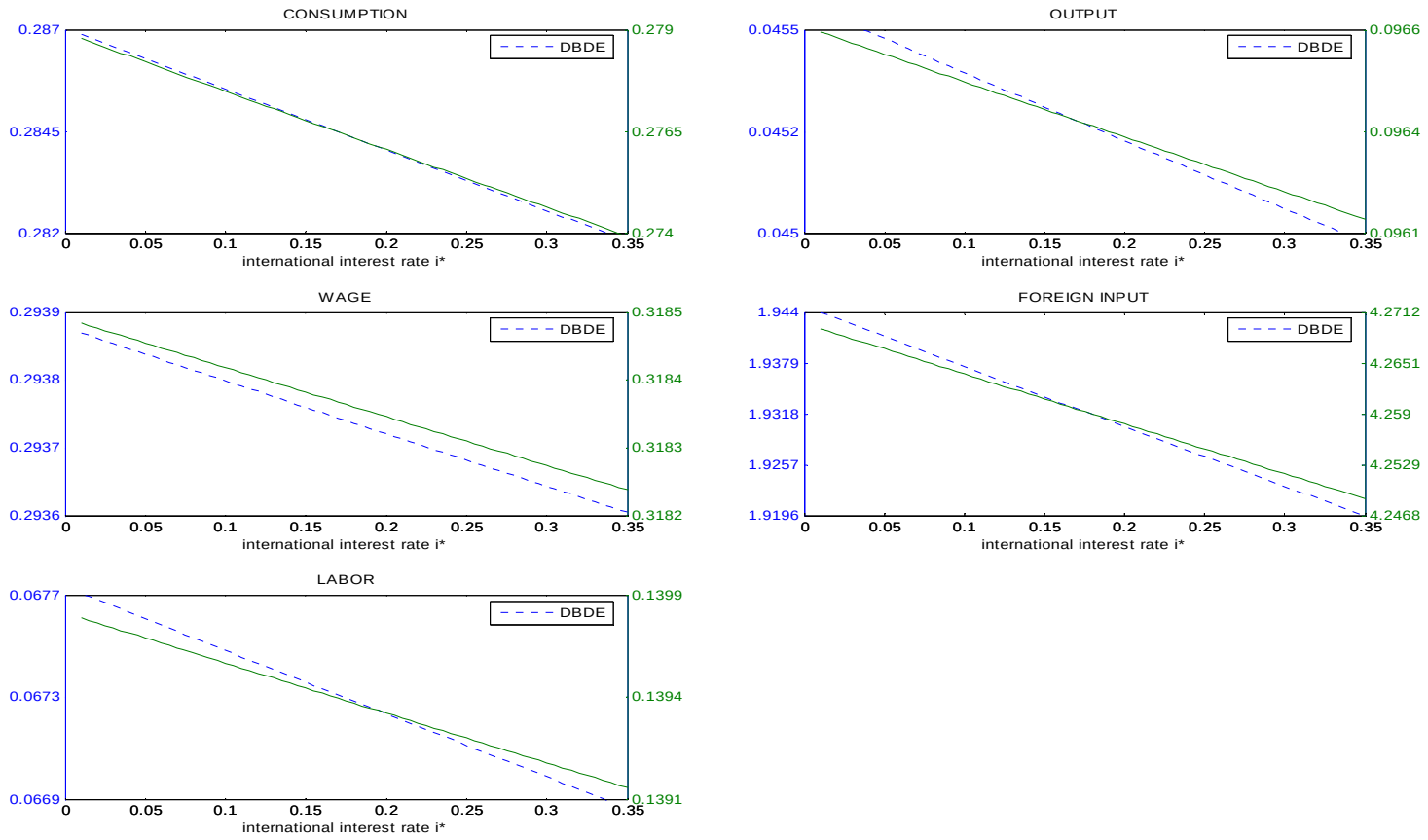


Figure 1. 4 International Interest Rate Shock

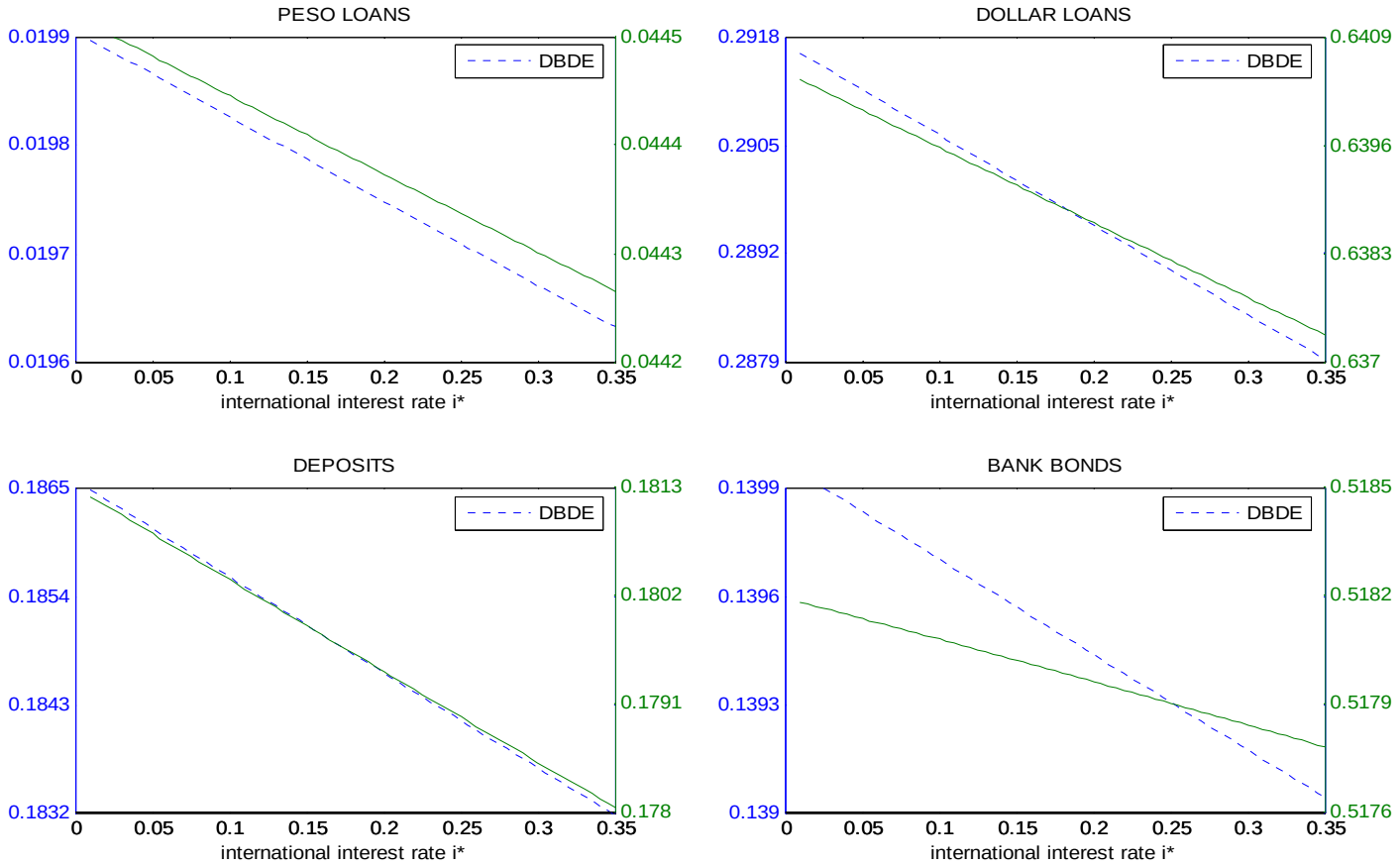


Figure 1.4 (Continued)

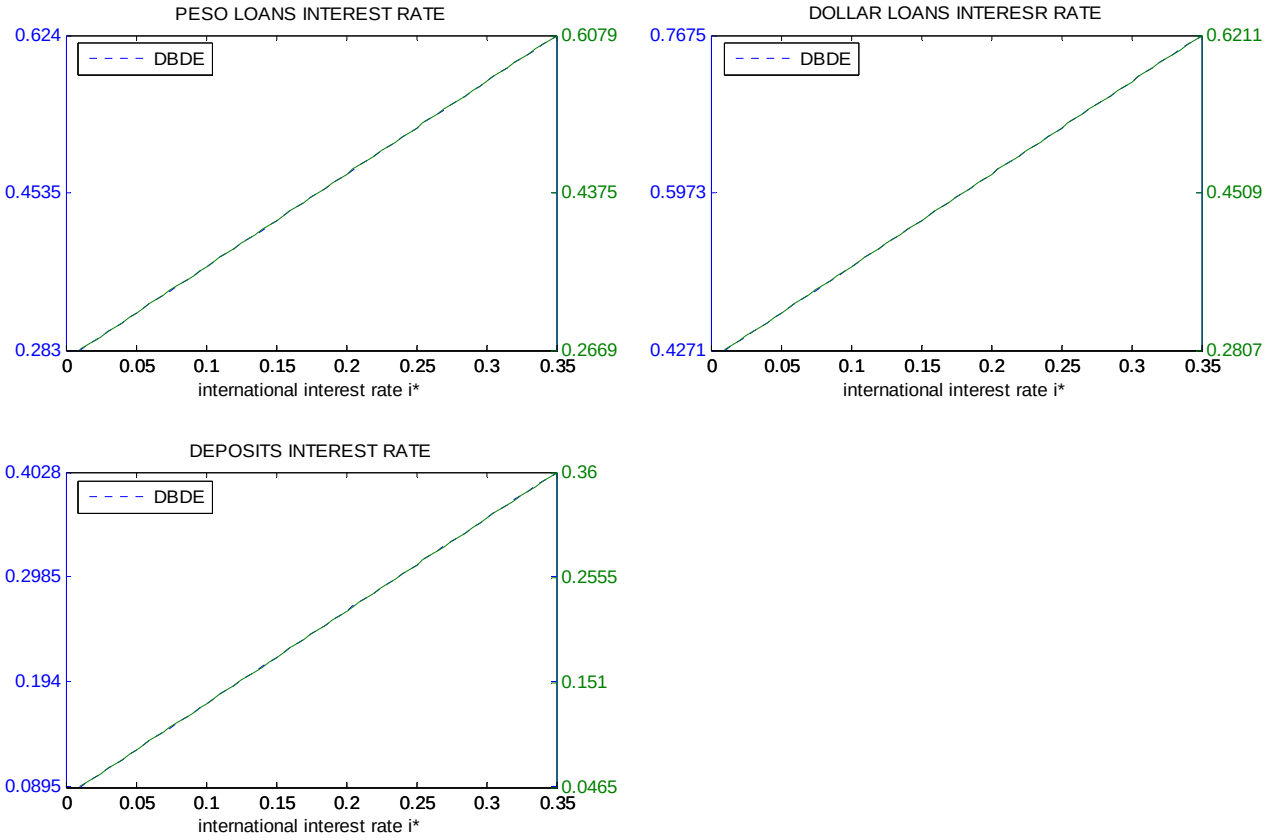


Figure 1.4 (Continued)

Note: The dashed line represents the variable of interest in domestic bank dominance economy. The values for the variables in domestic bank dominance economy are recorded on the left axis, while the values of variables in foreign bank dominance economy on the right axis.

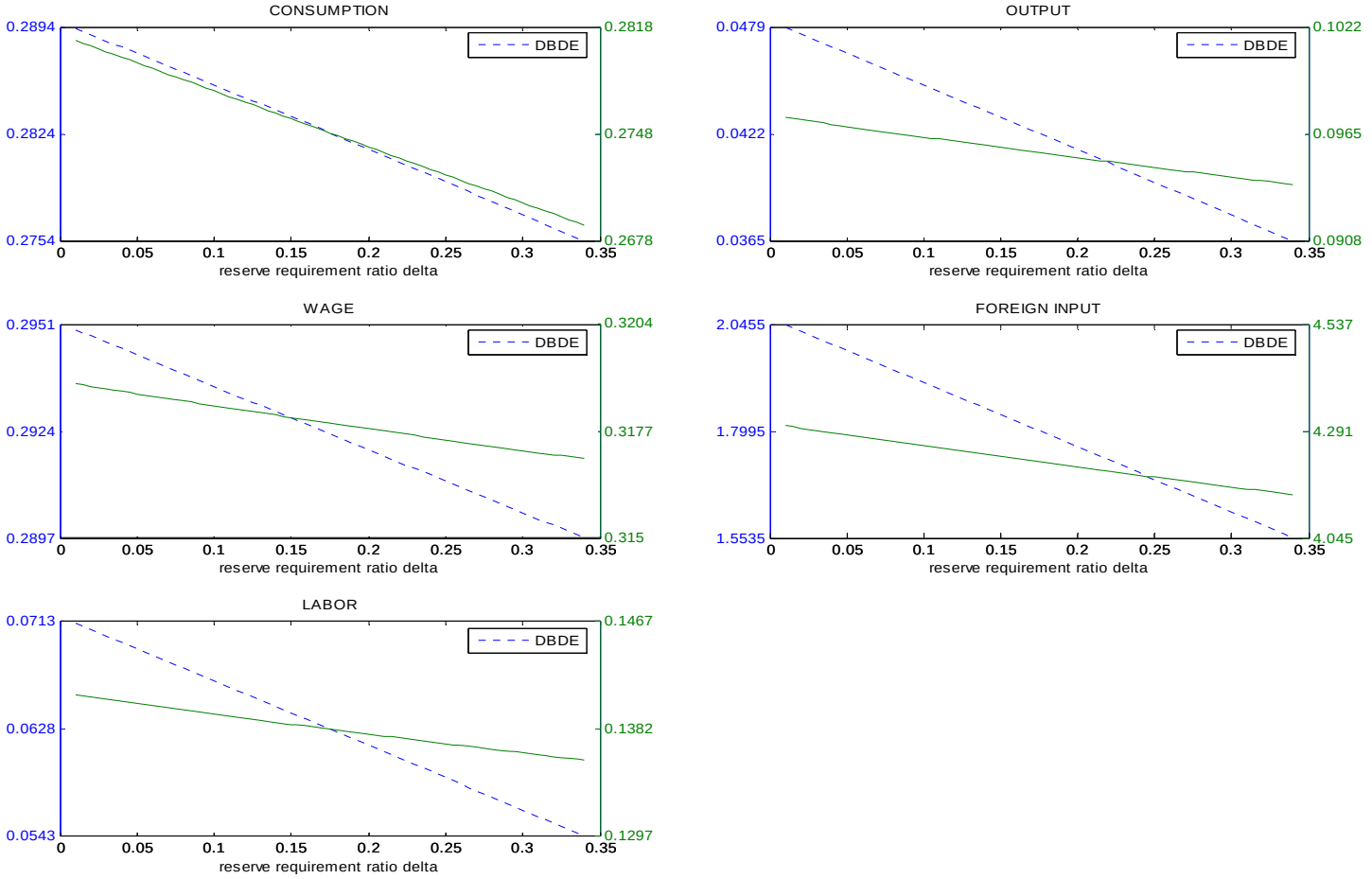


Figure 1. 5 Monetary Policy Shock

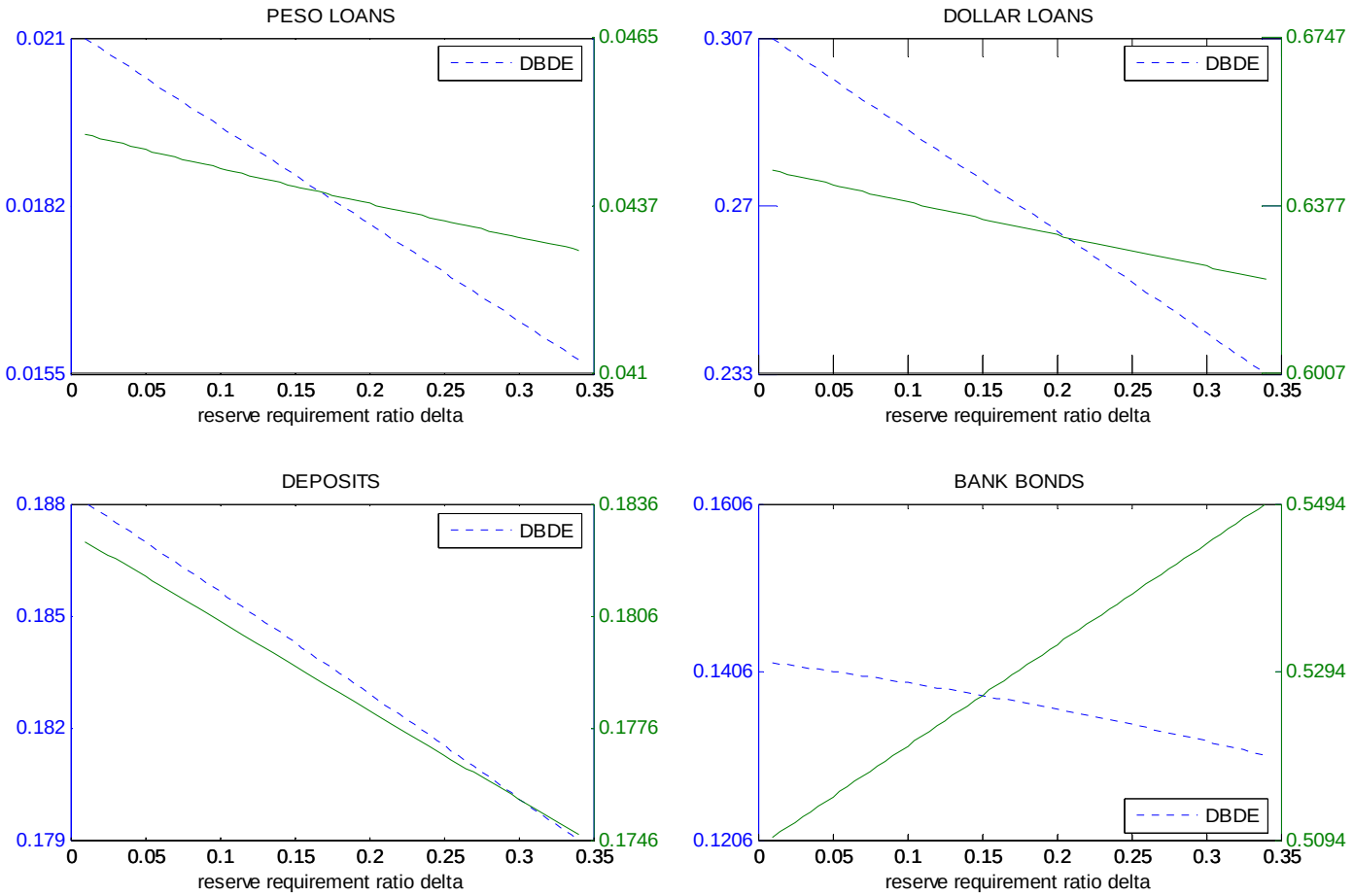


Figure 1.5 (Continued)

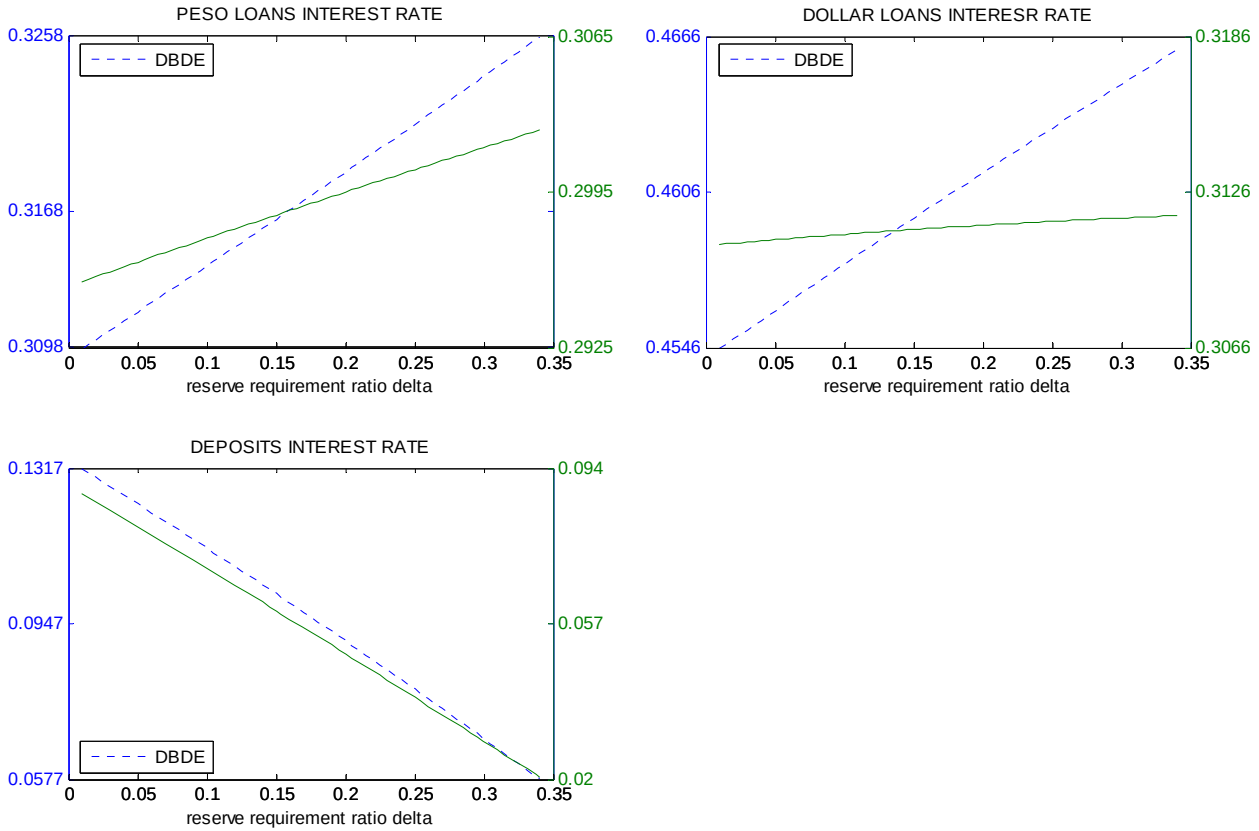


Figure 1.5 (Continued)

Note: The dashed line represents the variable of interest in domestic bank dominance economy. The values for the variables in domestic bank dominance economy are recorded on the left axis, while the values of variables in foreign bank dominance economy on the right axis.

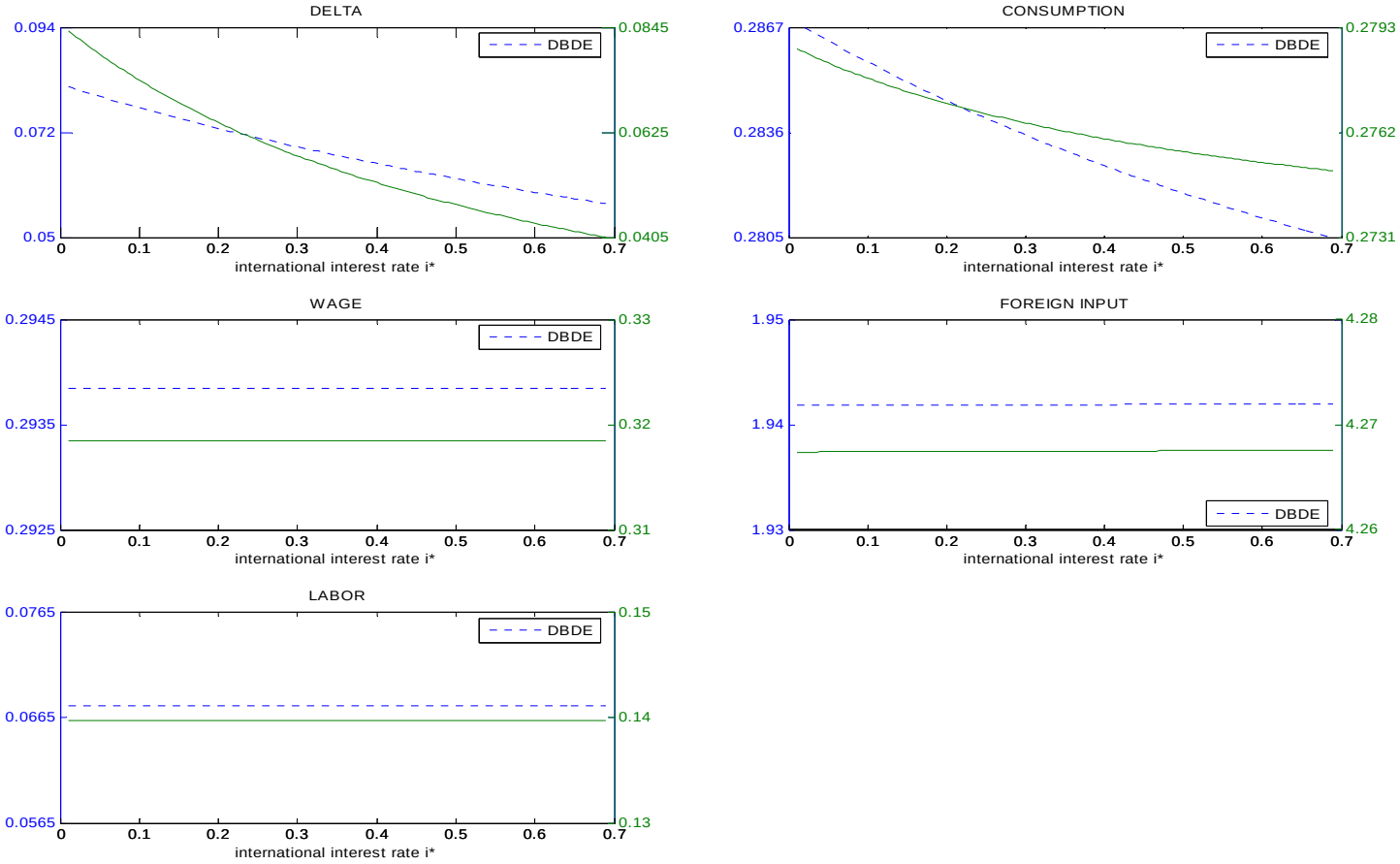
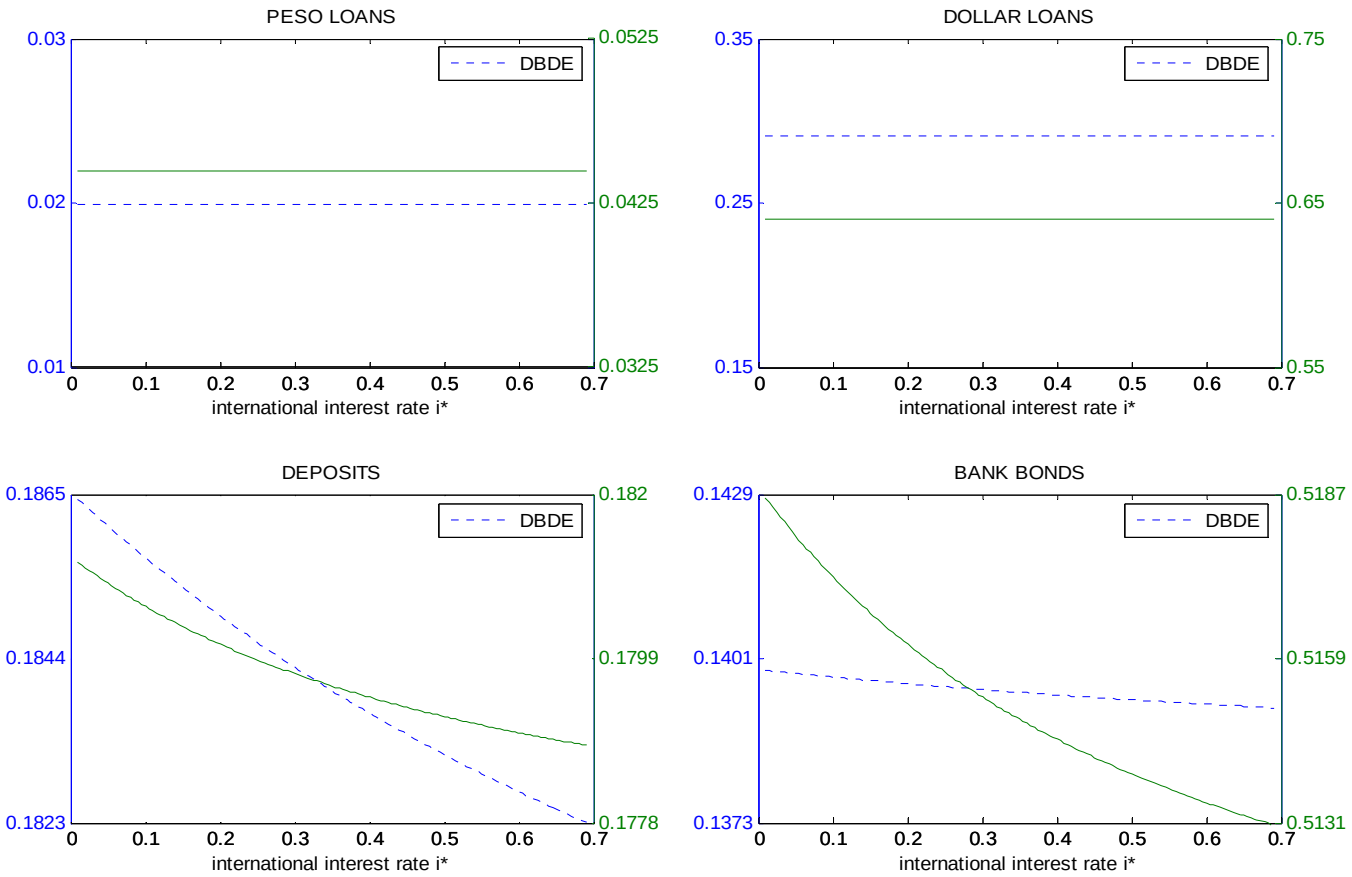


Figure 1. 6 Monetary Policy Adjustments to Stabilize Output



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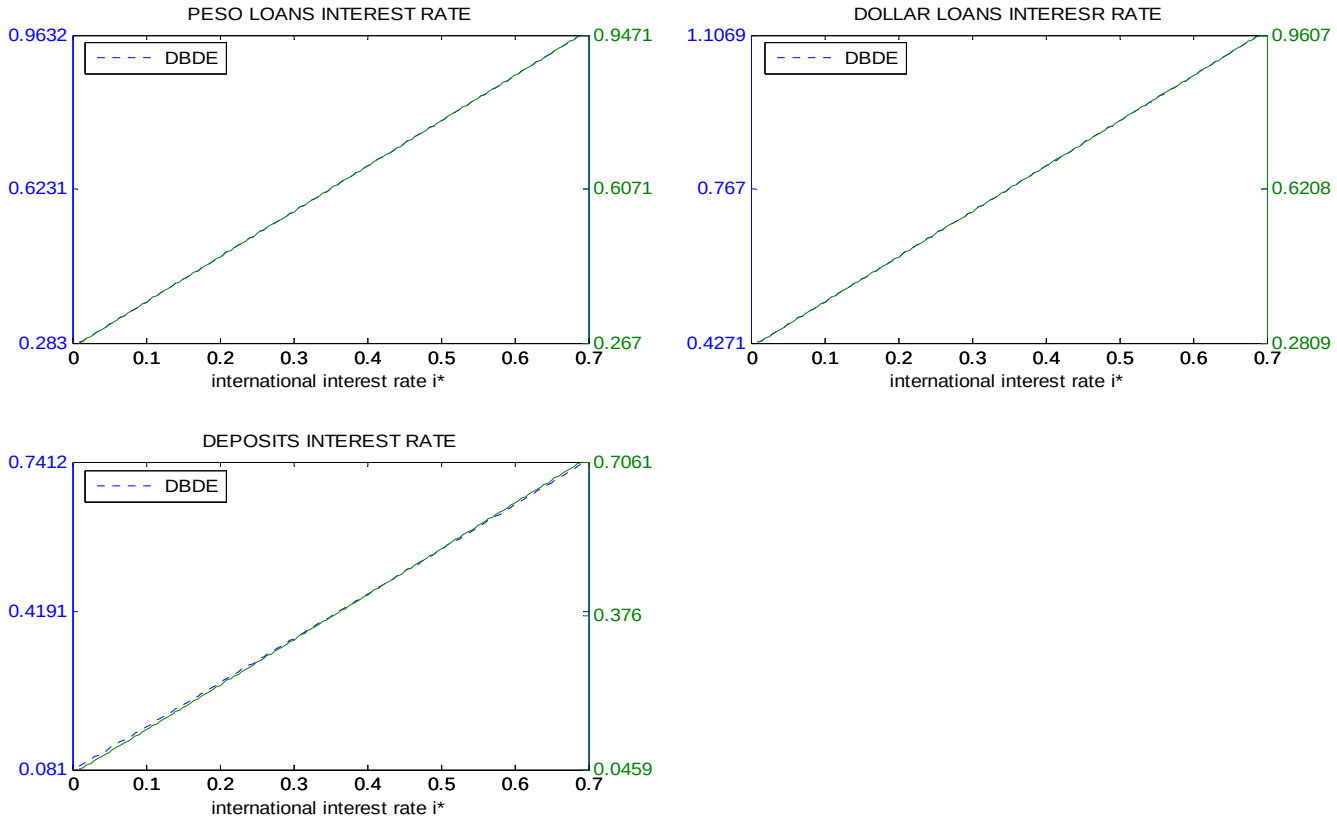


Figure 1.6 (Continued)

Note: The dashed line represents the variable of interest in domestic bank dominance economy. The values for the variables in domestic bank dominance economy are recorded on the left axis, while the values of variables in foreign bank dominance economy on the right axis.

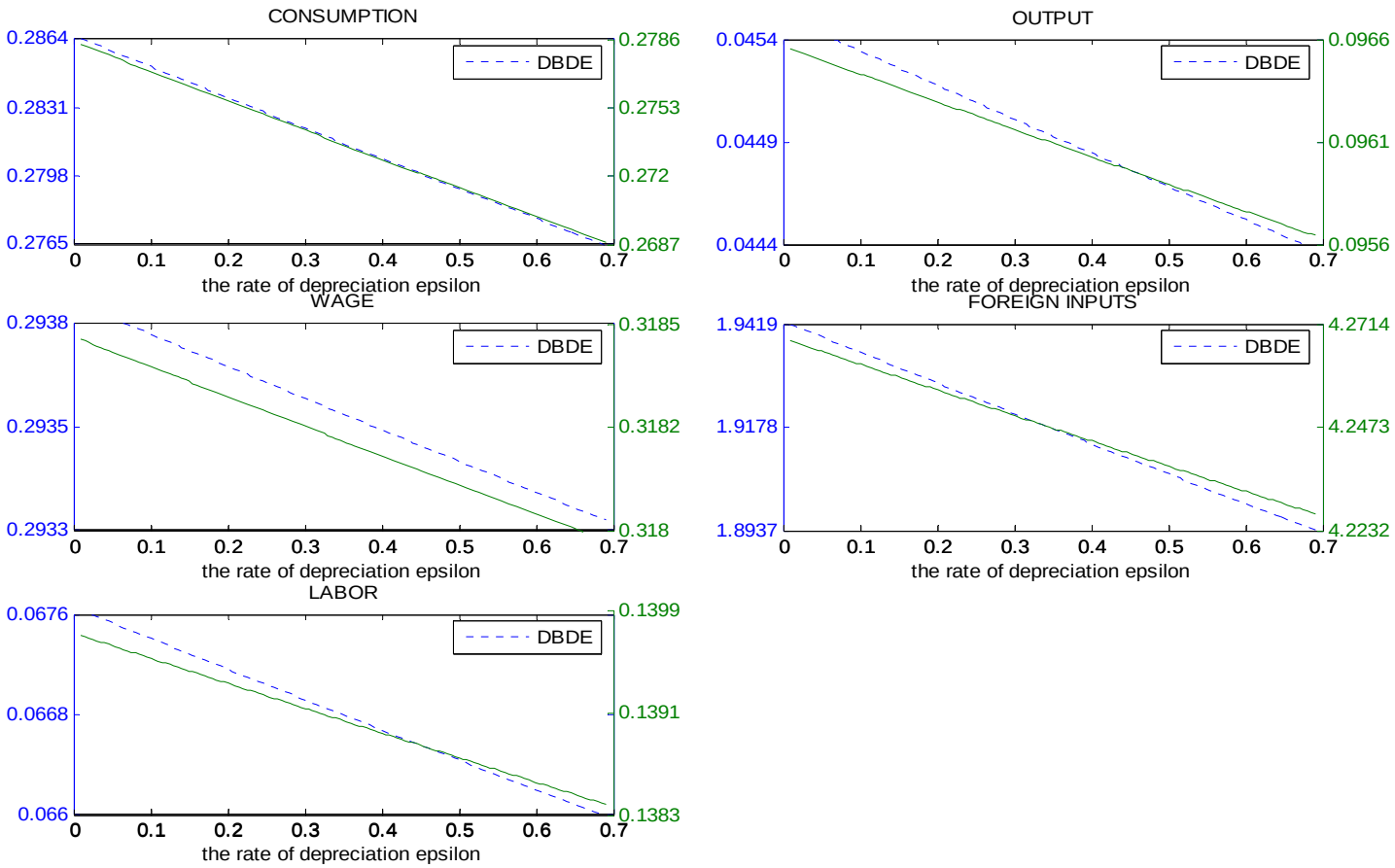
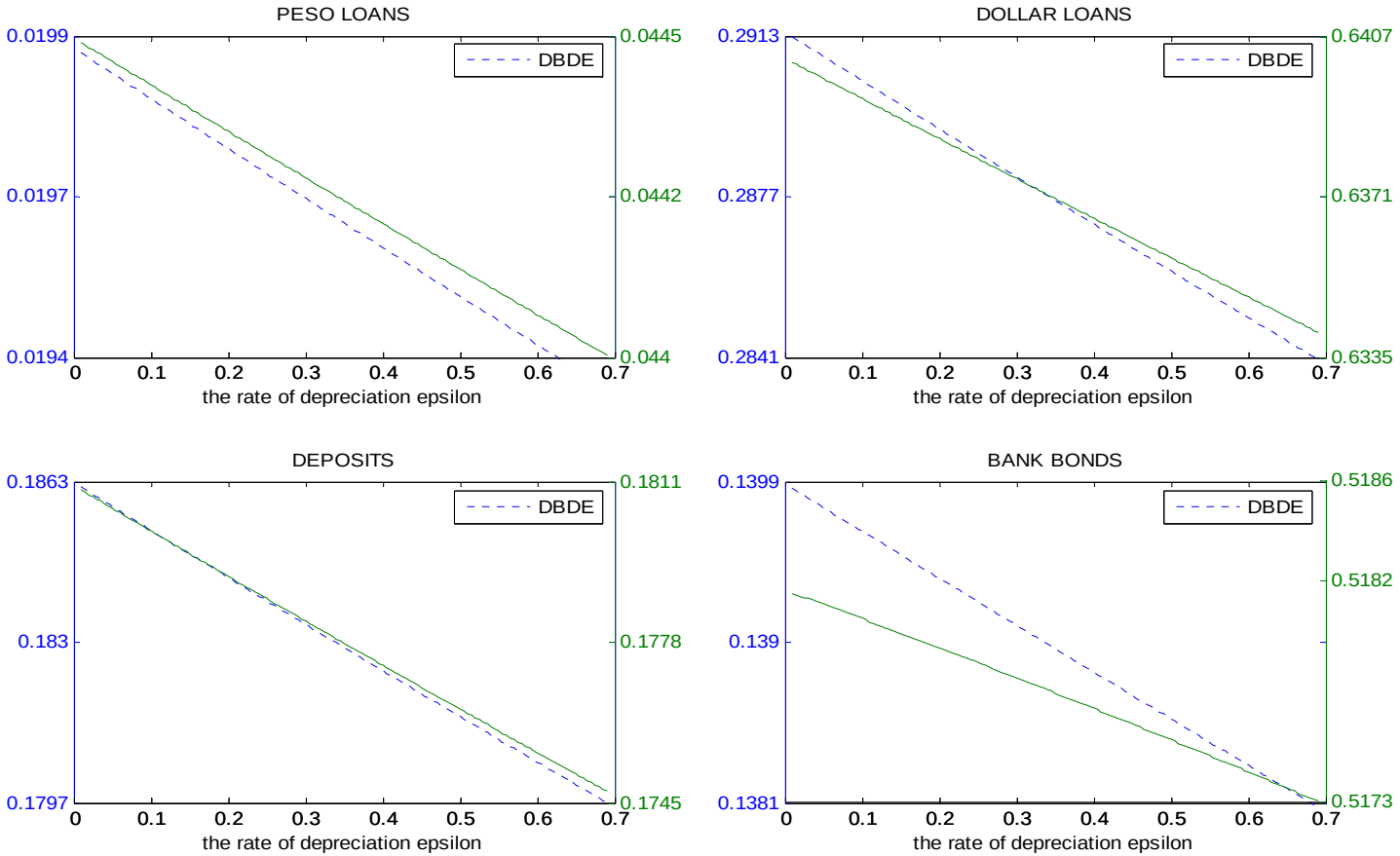


Figure 1. 7 Exchange Rate Policy Shock



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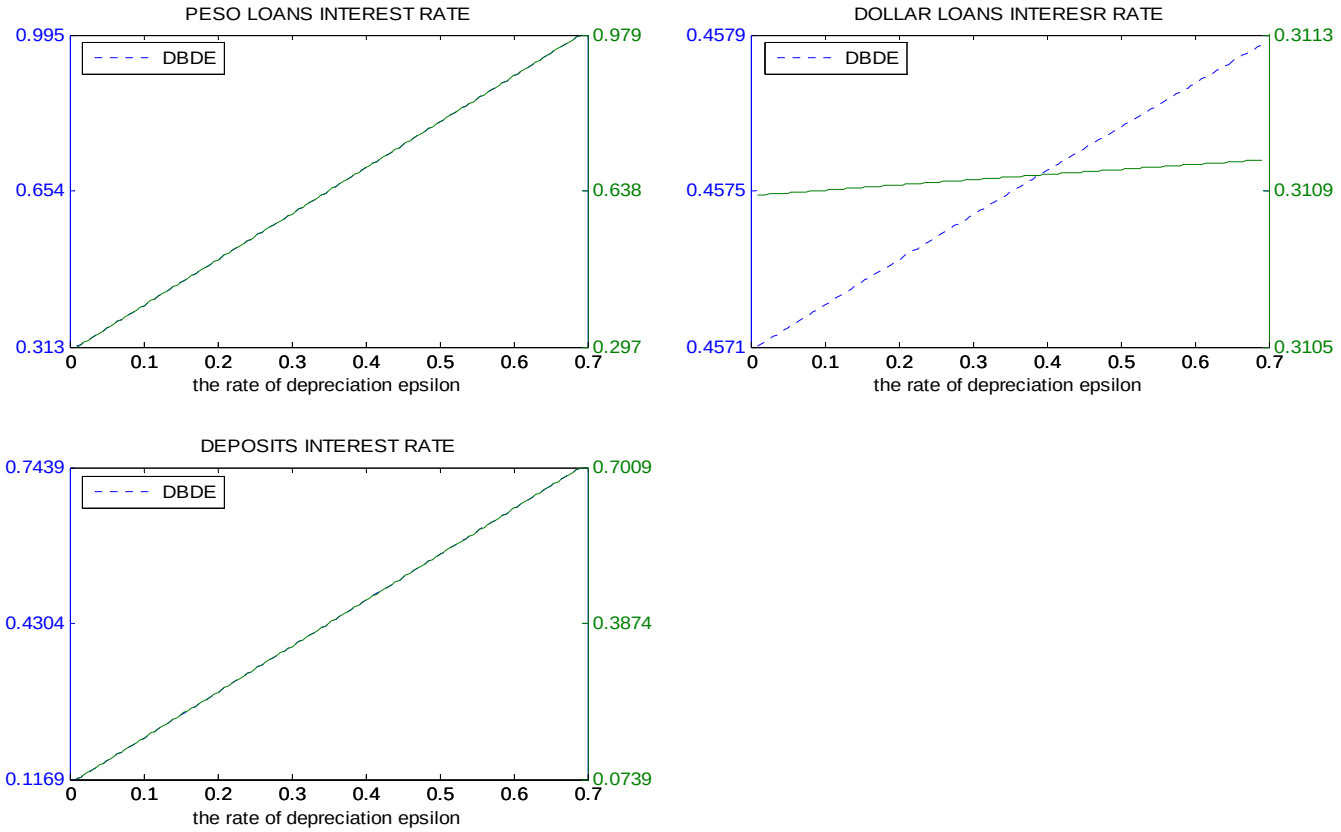
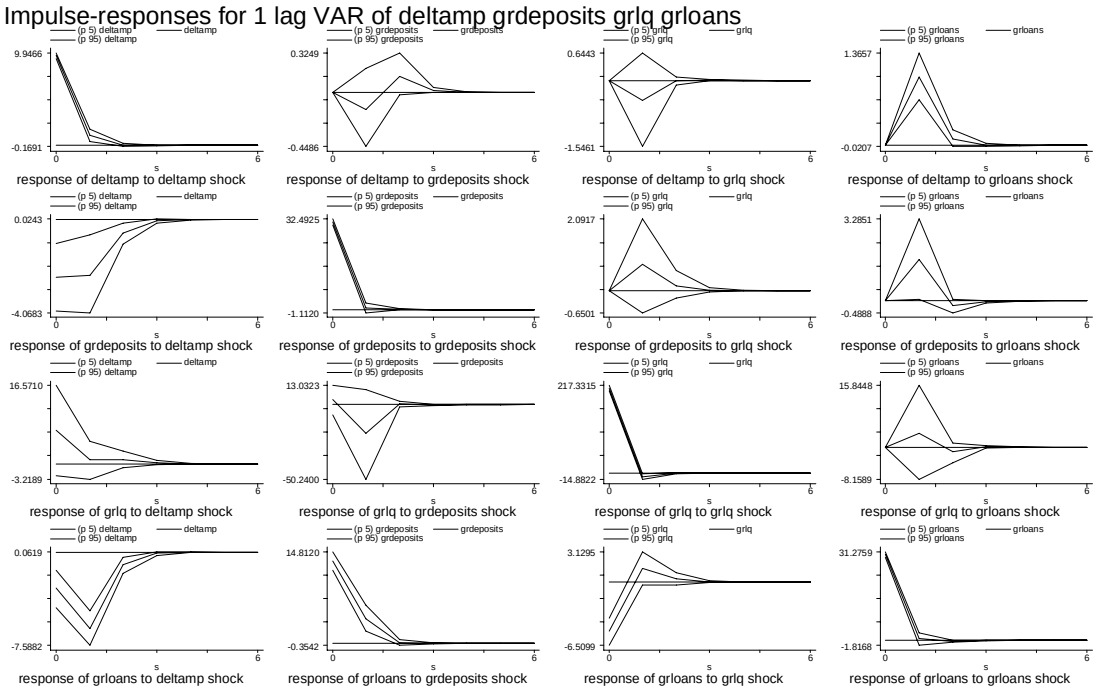


Figure 1.7 (Continued)

Note: The dashed line represents the variable of interest in domestic bank dominance economy. The values for the variables in domestic bank dominance economy are recorded on the left axis, while the values of variables in foreign bank dominance economy on the right axis.

(Domestic private banks)



(Foreign Banks)

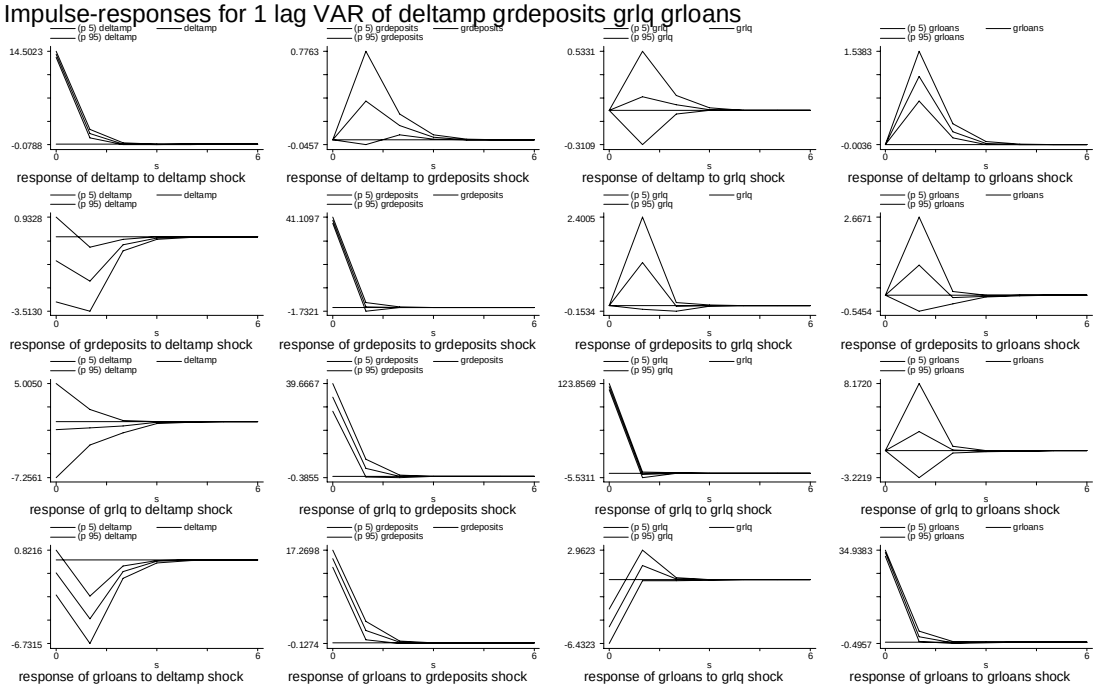


Figure 2. 1 Impulse Responses I

Note: Deltamp represents "the change in the domestic monetary policy indicator", grdeposits "the growth rate of deposits", grlq "the growth rate of liquidity", and grloans "the growth rate of loans".

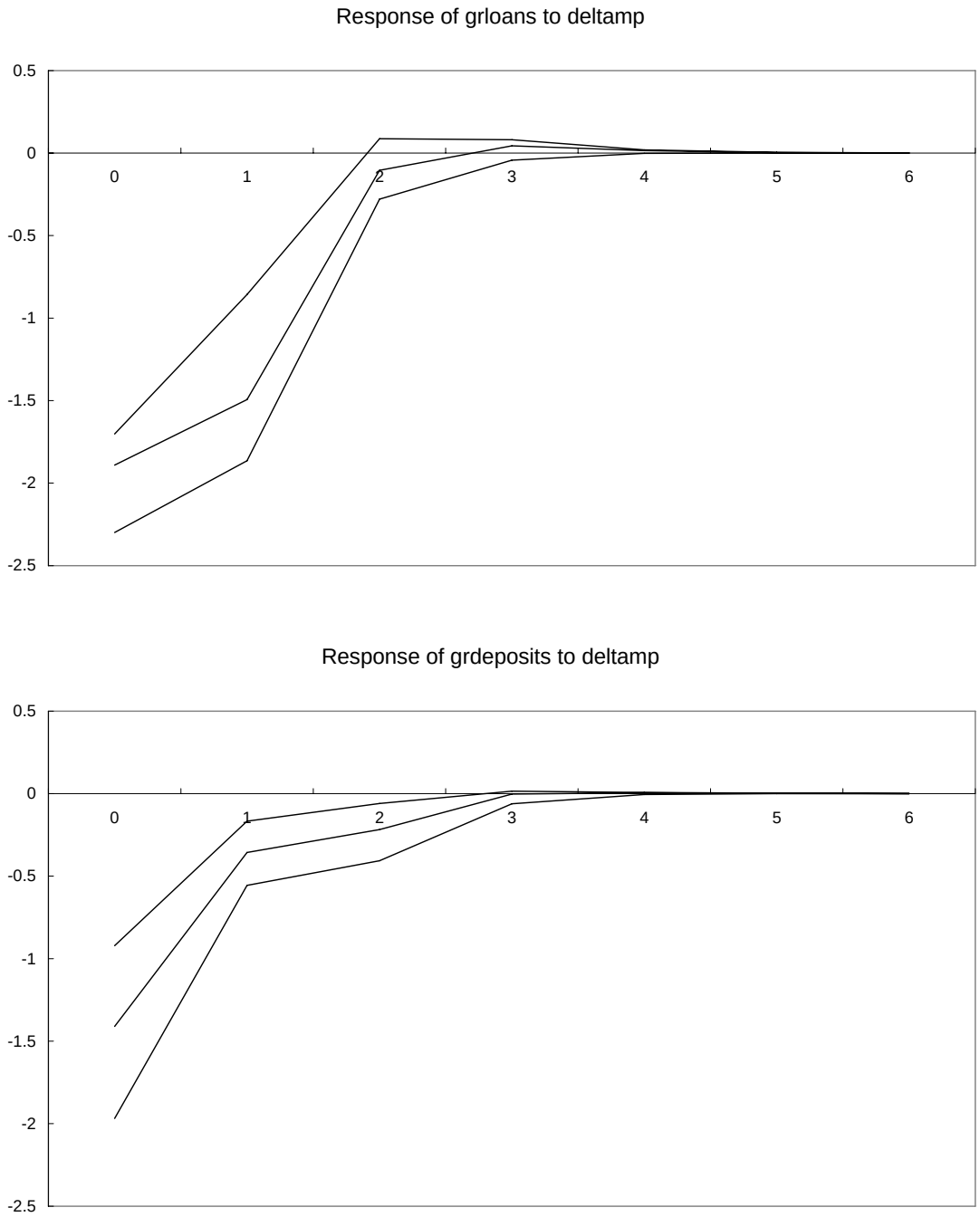


Figure 2. 2 Difference in Impulse Responses (Domestic - Foreign)

Notes: Deltamp represents “the change in the domestic monetary policy indicator”, grloans “the growth rate of loans”, and grdeposits “the growth rate of deposits”.

(Foreign Banks)

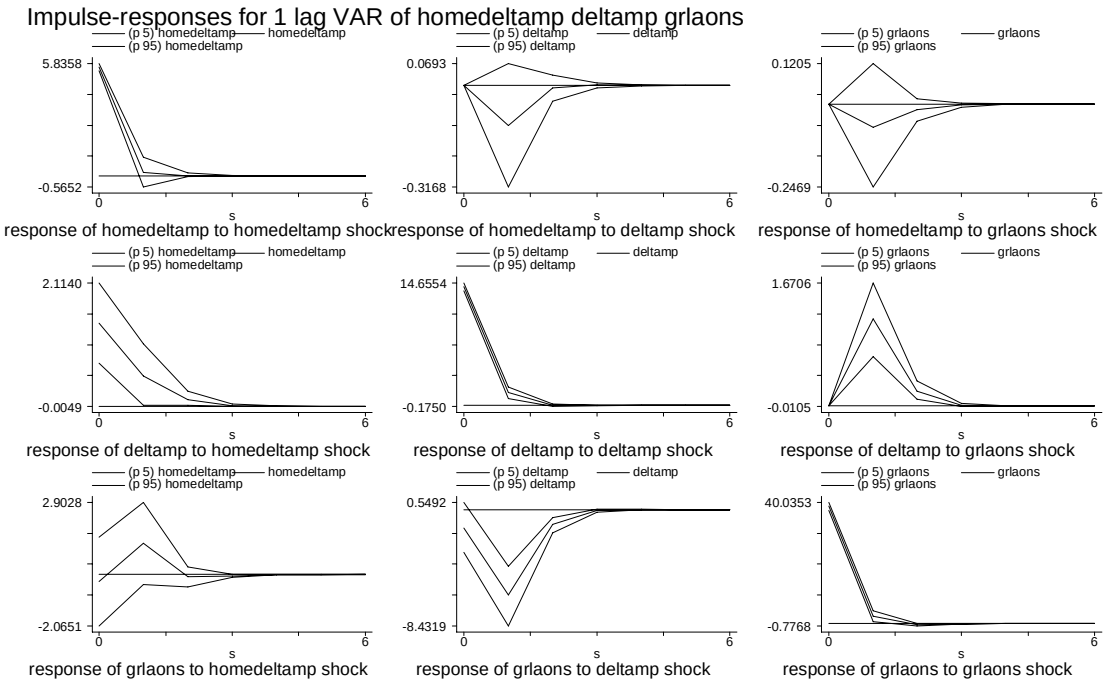
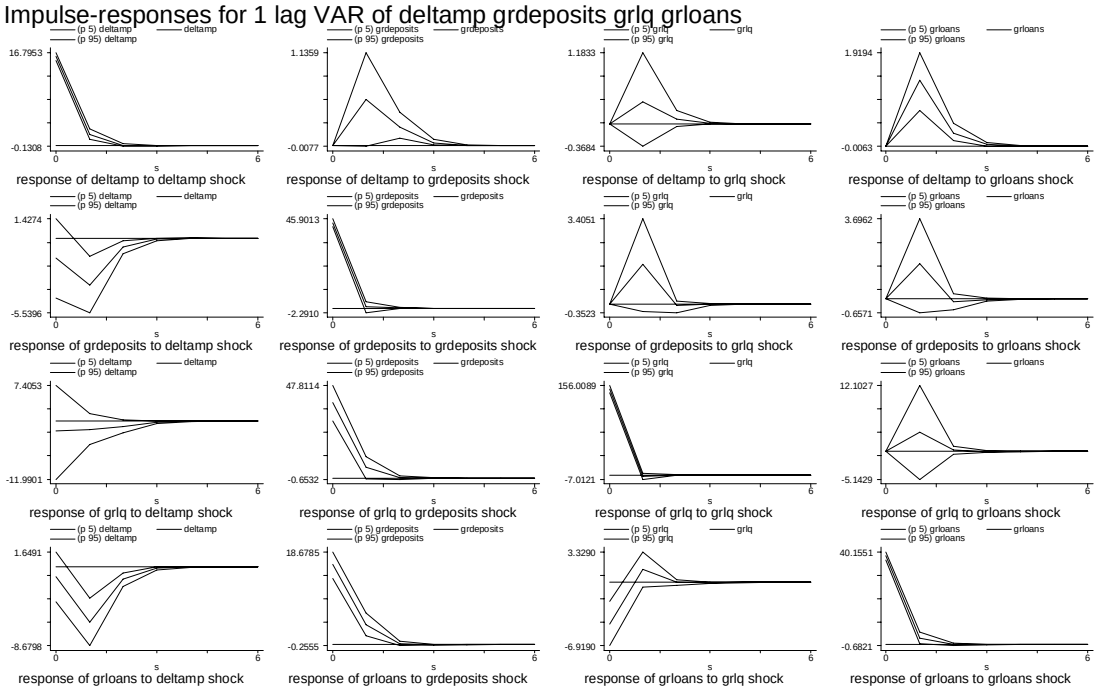


Figure 2. 3 Impulse Responses II

Notes: Homedeltamp represents “the change in the home country monetary policy indicator”, deltamp “the change in the domestic monetary policy indicator”, grloans “the growth rate of loans”.

(Greenfield foreign banks)



(Takeover foreign banks)

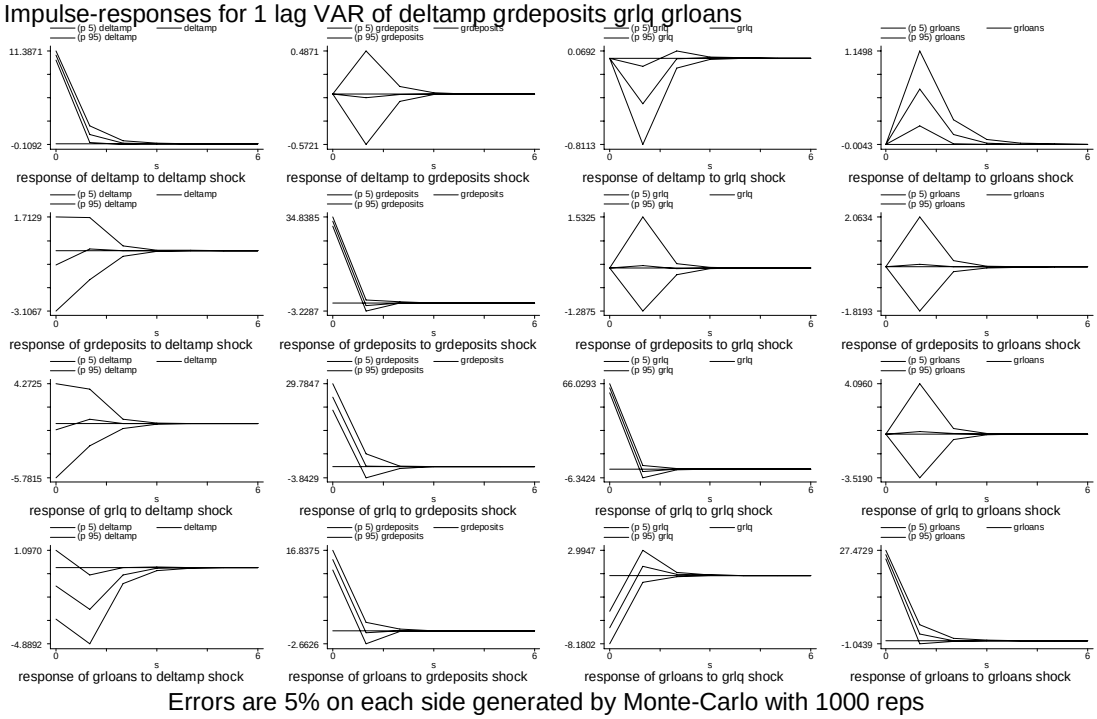


Figure 2. 4 Impulse Responses III

Note: Deltamp represents "the change in the domestic monetary policy indicator", grdeposits "the growth rate of deposits", grlq "the growth rate of liquidity", and grloans"the growth rate of loans"

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